



SOUTH UNIT BADLANDS NATIONAL PARK

DRAFT GENERAL MANAGEMENT PLAN & ENVIRONMENTAL IMPACT STATEMENT

AUGUST 2010



South Unit Draft General Management Plan / Environmental Impact Statement

Badlands National Park – South Unit

South Dakota

Badlands National Park, established in 1939 (as Badlands National Monument) and redesignated in 1978, is located approximately 70 miles from Rapid City, South Dakota. Most of the park is bordered by Buffalo Gap National Grassland, the Pine Ridge Indian Reservation, and private lands, primarily ranches and farms. The entire park is comprised of 242,756 acres, 64,144 acres of which have been designated as Wilderness. The South Unit, which includes the Palmer Creek Unit, consists of 133,300 acres.

Between 1982 and 1999, the North and South Units have been managed under a *Master Plan and Development Concept Plan*, but it became clear that a new plan would be needed to address issues and concerns confronting the park in the new millennium. Accordingly, in 1999 the National Park Service (NPS) authorized the development of a new plan that would reevaluate the park's needs and desired future conditions for both the North and South Units of Badlands National Park.

In 2000, the NPS held public scoping meetings as the initial stage of work on a new general management plan. In 2002, disagreements arose between the NPS and the Oglala Sioux Tribe (OST) regarding plans to conduct paleontological activities in the South Unit, ultimately leading to a moratorium on such activities. The NPS, OST, and Bureau of Indian Affairs (BIA) entered into formal consultation concerning the future management of the South Unit. At that time, the decision was made to continue the GMP process for the North Unit only, and to postpone the South Unit GMP/EIS until 2006. In 2006, the GMP was started, it included public meetings, newsletters, planning team meetings with NPS and Tribal members, review of public and agency comments, and incorporation of ideas into alternatives.

The South Unit GMP/EIS provides comprehensive guidance for perpetuating natural systems, preserving cultural resources, and providing opportunities for quality visitor

experiences at the South Unit. The purpose of the plan is to ensure that park managers and the public share the same vision of how best to achieve the park's purpose and protect its resources unimpaired for future generations.

This GMP/EIS describes the general path for park managers to follow in managing the South Unit for the next 20 or so years. The plan does not provide specific and detailed answers to every issue facing the park. Rather, it is a framework to assist South Unit managers in making decisions today and into the future.

Alternative A, the No-Action Alternative, reflects current conditions and activities at the Park. It is provided as a baseline against which to compare the other action alternatives. Alternative B primarily focuses on expanded access and opportunities for visitors to the South Unit. Opportunities include interpretation of natural and cultural resources. Alternative C primarily focuses on preservation and protection of natural and cultural resources, and restoration of natural systems. Access would be limited primarily to the perimeter of the South Unit. Visitor opportunities include interpretation of natural, cultural, and paleontological resources. Alternative D (the preferred alternative) primarily focuses on restoration of natural ecosystems with expanded access and recreational opportunities for visitors. Additional opportunities would include interpretation of natural, cultural, and paleontological resources. The preferred alternative would promote understanding of Oglala Sioux history, culture, and land management principles through education and interpretation. Visitor activities would be focused in a developed front-country area that would provide a variety of services and amenities around the perimeter, while the interior of the South Unit would be managed as backcountry. Natural resources management would focus on survey and research to provide data to support future restoration, interpretation, and educational activities. Cultural resources management would focus on protection and

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preservation of historic, spiritual, and ceremonial sites and materials.

This document is being distributed to other agencies, tribal governments, and interested organizations and individuals for their review. Following distribution of the final plan and a 30-day no-action review period, a Record of Decision will be signed by the Badlands National Park superintendent and the NPS regional director documenting the NPS selection of an alternative for implementation.

How to Comment on this Plan

The draft GMP/EIS will be on review for 60 days from the date the U.S. Environmental Protection Agency notice of availability is published in the Federal Register. During this time, the planning team will hold public open houses for interested members of the public to comment on the document. The public can also comment electronically on the NPS' Planning, Environment, and Public Comment (PEPC) website at <http://parkplanning.nps.gov/projectHome.cfm?p>

arkId=117&projectId=17543 and/or the Badlands National Park's website at www.nps.gov/badl. The public is also welcome to mail comments directly to the park at the following address:

Superintendent, Badlands National Park,
P.O. Box 6, Interior, South Dakota 57750

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses available for public inspection in their entirety.

EXECUTIVE SUMMARY

BRIEF DESCRIPTION OF BADLANDS NATIONAL PARK

Badlands National Park, established in 1939 (as Badlands National Monument) and redesignated in 1978, is located approximately 70 miles from Rapid City, South Dakota. Most of the park is bordered by Buffalo Gap National Grassland, the Pine Ridge Indian Reservation, and private lands, primarily ranches and farms. The entire park is comprised of 242,756 acres, 64,144 acres of which have been designated as Wilderness. The South Unit, which includes the Palmer Creek Unit, consists of 133,300 acres.

PURPOSE FOR THE GENERAL MANAGEMENT PLAN/ ENVIRONMENTAL IMPACT STATEMENT

Park planning is a decision-making process, and general management planning is the broadest level of decision making for parks. General management plans are required for all units of the National Park System and are intended to establish the future management direction of a park.

Since 1982, the North and South Units had been managed under a *Master Plan and Development Concept Plan*, but it became clear that a new plan would be needed to address issues and concerns confronting the park in the new millennium. Accordingly, in 1999, the National Park Service (NPS) authorized the development of a new plan that would reevaluate the park's needs and desired future conditions for both the North and South Units of Badlands National Park. In 2000, the NPS held public scoping meetings as the initial stage of work on a new general management plan. In 2003, disagreements arose between the NPS and Oglala Sioux Tribe (OST) regarding the conduct of paleontological activities in the South Unit, ultimately leading to a moratorium on such activities. The NPS, OST, and Bureau of Indian Affairs (BIA) entered into formal negotiations concerning the future management of the South

Unit. At that time, the decision was made to continue the planning process for the North Unit only, and to postpone the South Unit general management plan until 2006.

In late 2006, concurrently with the arrival of a new park superintendent, the OST charged a tribal agency, the Oglala Sioux Parks and Recreation Authority (OSPRA), with the responsibility to work with the NPS, and the South Unit general management plan effort resumed.

This general management plan provides comprehensive guidance for perpetuating natural systems, preserving cultural resources, and providing opportunities for quality visitor experiences at the South Unit. Its purpose is to ensure that park managers and the public share the same vision of how best to achieve the park's purpose and protect its resources unimpaired for future generations.

IMPLEMENTATION OF THE GENERAL MANAGEMENT PLAN

Although the South Unit GMP/EIS provides the analysis and justification for future South Unit funding proposals, this plan does not guarantee future NPS funding. Many actions would be necessary to achieve the desired conditions for natural resources, cultural resources, visitor experience, and facilities as envisioned in this plan. The NPS or the OST will request funding to achieve these desired conditions; although both entities hope to secure this funding and will prepare accordingly, the South Unit may not receive enough funding to achieve all desired conditions.

The implementation of the approved plan also could be affected by other factors. Once the South Unit GMP/EIS has been approved, additional feasibility studies and more detailed planning and appropriate environmental documentation may be required before any proposed actions can be carried out. Additional planning and/or revisions may be needed, depending on which alternative is implemented and what funding levels are achieved. These

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more detailed plans would tier off of this South Unit GMP/EIS, describing specific actions managers intend to take to achieve desired conditions and long-term goals. Some of these implementation plans are prepared for parks in response to NPS policies.

When the Record of Decision is signed, and if the preferred management option and alternative remain similar to what is outlined in this document, implementation would not be possible without legislation and funding. The status quo would remain in effect until both the legislation and funding are in place. In the interim, the park and tribe agree to prepare for and implement the parts of this plan that are possible and appropriate.

This GMP/EIS calls for a commitment to the NPS *Organic Act* which would include an overall general adherence to NPS policies, regulations, guidelines, and laws; and Tribal law, policies and resolutions. The combination of these could alter the management actions and practices of the South Unit in ways unforeseen at this time.

MANAGEMENT ZONES

Management zones prescribe how different areas of the South Unit would be managed and are thus focused on the future or desired conditions. Each management zone specifies complementary natural resource conditions, cultural resources conditions, opportunities for visitor experiences, and appropriate facilities, and combines these into a possible management strategy that could be applied to locations within the South Unit. As such, management zones describe the management priorities or long-term goals for various areas.

To help readers understand the similarities and differences in management in the North and South Units, the planning team decided to keep the names of the management zones that were identified in the North Unit GMP, where possible, recognizing that the different resources in the South Unit might require modifications in the zone descriptions. Six management zones were carried over from the North Unit GMP (Natural Area / Recreation Zone, Development

Zone, Semi-primitive Zone, Preservation Zone, Driving/Sightseeing Zone, and Research Zone), and the planning team added the Ceremonial Zone. To avoid overlap in intent, these zones were refined to four key zones based on the focus of the alternatives: Natural Area / Recreation Zone, Preservation Zone, Research Zone, and Development Zone.

Regardless of the title of the management zone, the NPS and the OST intend to preserve and protect natural and cultural resources to the greatest extent possible. An overview of the management zones is provided in table 1. The action alternatives presented later in this executive summary each propose a different concept for managing the South Unit; therefore, the management zones were placed in different locations or configurations on the map according to the overall focus of each alternative.

MANAGEMENT OPTIONS

In response to a need to increase the involvement of Tribal members in decision making for the South Unit, the NPS and the OST, within this planning process, developed concepts for structuring the management of the South Unit. Between March and May 2007, the planning team discussed a range of seven options for managing the South Unit. The seven options included four options that have been carried throughout the process (no action, shared management, NPS-affiliated area, and deauthorization) and one option that became the preferred management option, Tribal National Park. Two of the seven options discussed were brought to the table by members of the Tribe's Oyate group. In reviewing these options, the team agreed that three of the seven options would fit within the four described above.

In discussing how these management options would be treated in the South Unit GMP/EIS, the planning team concluded that the decision on the management option should be determined through consultation between the NPS and the OST government. It became clear from discussions with Tribal officials and members and from public comments on the first newsletter that the final disposition of the South Unit would not be a simple decision. Sentiments

ranged from turning the management of the land back to the OST to continuing current management.

The proposed preferred management option is supported by the planning team, the Badlands Superintendent, the Midwest Regional Director, the NPS Director, OSPRA, and the OST Tribal Council and President.

The preferred management option would require congressional action to re-establish the South Unit as a distinct National Tribal Park managed by the OST. The following summarizes the management options, including the preferred:

Option 1: Continue Current

Management. Option 1, Continue Current Management, assumes that the NPS would continue to manage the South Unit as at present. The NPS would continue to be responsible for the overall administration of the South Unit and the day-to-day on-site activities, providing two full-time positions. Existing operations and visitor facilities would remain in place, concentrated at White River, and the White River Visitor Center would continue to be the principal visitor contact station in the South Unit until the Lakota Heritage and Education Center (LHEC) is built. The NPS and OST would share responsibility for operation of the White River Visitor Center, with the NPS primarily responsible for maintaining the visitor center and providing training and development of interpretive volunteers and staff. The OSPRA would be responsible for staffing the White River Visitor Center. Jointly, the NPS and OSPRA would continue to develop exhibits and provided visitor programming in the summer months.

Under the 1976 Memorandum of Agreement currently in effect, 50 percent of the entrance fees collected at the park entrance gates in the North Unit would continue to be collected on behalf of the OST and directed to OSPRA for expenditures in the South Unit. NPS employees would continue to report to the superintendent of Badlands National Park. Tribal employees who staff the White River Visitor Center would continue to be Tribal

employees responsible to the Executive Director of OSPRA.

Under the current agreement, resources would continue to be managed by the OST to perpetuate and protect the natural environment and preserve cultural resources, following the federal laws, regulations, and policies that govern units of the national park system. Hunting would still be permitted for Tribal members only, as regulated by the OST. The NPS would be responsible for implementation of the South Unit GMP/EIS.

Option 2: The Preferred Management Option: Tribal National Park.

In this option, Congress would designate the South Unit of Badlands National Park as a Tribal National Park, managed and administered by the OST and closely associated with the national park system. The Tribal National Park would be managed in a manner consistent with the Tribal laws and resolutions of the OST and guided by all laws and policies generally applicable to units of the national park system. This option would ensure that the Oglala Lakota people manage, own, and operate their lands for the educational and recreational benefit of the general public. Once construction of the LHEC is complete, it would be the primary visitor contact area for the park and an important component of the visitor experience. Until the LHEC is operating, the White River Visitor Center would be the primary visitor contact area for the park. The OST would be responsible for training and development of staff and volunteers with technical assistance from the NPS, if requested.

A new agreement would be established between the OST and the NPS to clarify the administrative and procedural details necessary for the full transition of park management from direct NPS oversight to the OST. Upon execution of the new agreement, the 1976 Memorandum of Agreement would be replaced. The agreement would contain a Tribal park staffing plan, organizational plan, and

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business plan prepared by the OST with the assistance of the NPS. When completed, the agreement would be submitted to the OSPRA board, the OST Council and President, and the NPS, before being routed to the Secretary of the Interior for final approval.

The Tribal National Park would be identified by signs featuring the OST logo and the NPS arrowhead. The park would be funded by federal appropriations and entrance fees. The Tribal National Park would receive an annual funding appropriation from Congress to manage and operate the park and would also be allowed to compete for monies and technical assistance within the established NPS allocation process. Technical assistance could include interpretation, resource protection, and development of the LHEC. Additionally, the Tribal National Park would be authorized to implement an entrance fee with the provision that those funds would be used for park operations.

At the start of the transition, experienced NPS employees would staff administrative and resource positions, mentoring Tribal employees in managerial and other skills through on-the-job and in-service training and other professional developmental programs. As the Tribal employees develop the necessary skills, they would step into the positions previously held by NPS employees and assume responsibilities for park operation. Tribal park employees would receive on-the-job training; would have access to NPS servicewide training as well as relevant training opportunities outside the NPS; and would have opportunities to take relevant training and coursework outside the NPS at local or regional institutions of higher education, funded by NPS. Ultimately, staff of the Tribal National Park would be OST employees. As soon as practicable, the park would be wholly under Tribal management.

Resources would be managed to perpetuate and protect the natural environment and to preserve cultural and historic resources and

values, following the ordinances and regulations established by the OST and the policies pertaining to units of the national park system. Hunting would be permitted for Tribal members only as regulated by the OST. The OST would be responsible for implementation of the South Unit GMP/EIS.

The preferred management option would require congressional action to reestablish the South Unit as the first National Tribal Park, managed by the OST and closely associated with the national park system.

Option 3: Shared Management. Under option 3, the NPS and the OST would share responsibility for the day-to-day on-site management of the South Unit within Badlands National Park. Associated visitor activities would be managed jointly under terms and conditions of a new agreement. The Tribe would assume more direct control over the operation and management of the South Unit than currently. Existing operations and visitor facilities would remain concentrated at White River, and the White River Visitor Center would continue to be the principal visitor contact area in the South Unit until the LHEC is built. The NPS and the OST would share responsibility for managing the visitor center and for training and development of staff and volunteers. In order to facilitate a strong partnership, the NPS would provide training and funding to the OST to assume tasks and positions necessary for shared management of the South Unit. NPS employees would work side-by-side with OST employees.

A new agreement would be negotiated and the 1976 Memorandum of Agreement would be replaced. The new agreement would determine how expenses in the South Unit would be funded. In order to bring greater attention to the resources and opportunities at the South Unit, additional park signs would be placed along the major roads (I-90; US 385; Routes 73, 44, and 79; and BIA Route 2) to direct visitors into the South Unit. NPS employees would report to

the superintendent of Badlands National Park. Tribal employees staffing the White River Visitor Center would be Tribal employees responsible to the South Unit manager.

Resources would be managed to perpetuate and protect the natural environment and preserve cultural resources, following the laws governing activities of the NPS and ordinances and regulations established by the OST. Hunting would still be permitted for Tribal members only, as regulated by the OST. The NPS and the OST would be responsible for implementation of the South Unit GMP/EIS.

Option 4: Affiliated Area. To show the track of the administrative history, option 4 has been included, even though it is similar to the preferred option. In option 4, the South Unit of Badlands National Park would be managed solely by the OST as an affiliated area of the national park system. The OST would be responsible for the administration and the day-to-day on-site operations. Existing operations and visitor facilities would remain in place, concentrated at White River, and the White River Visitor Center would continue to be the principal visitor contact station in the South Unit. Until the LHEC is built, the OST would be responsible for operation of the visitor facilities and services. The NPS would provide technical expertise and policy guidance as requested. Interpretive activities and visitor education would be directed by the OST, with technical assistance from the NPS, as requested. Technical assistance could include design and content of brochures, exhibits, and interpretive programs.

At the reestablishment of the South Unit as an affiliated area—separate from Badlands National Park—the 1976 Memorandum of Agreement would be replaced, resulting in loss of entrance fee revenue. The OST, as the managing entity, would be required to find and develop its own funding sources for operation of the South Unit Affiliated Area, and could choose to implement an

entrance fee for access and use of the Affiliated Area. Staff of the affiliated area would be employed by the OST. The OST, working in conjunction with other state and federal agencies, could place signs along the major roads (I-90; US 385; Routes 73, 44, and 79; and BIA Route 2) to direct visitors into the Affiliated Area.

Resources would be managed to perpetuate and protect the natural environment and preserve cultural resources, following the ordinances and regulations established by the OST and the laws and policies pertaining to units of the national park system. Hunting would be permitted, as regulated by the OST. The OST would be responsible for implementation of the South Unit GMP/EIS.

Option 4 would require congressional action to reestablish the South Unit as an affiliated area of the national park system.

Option 5: New National Park. To show the track of the administrative history, option 5 has been included even though it is similar to the preferred option.

Under option 5, Congress would reestablish the South Unit as a distinct national park, a distinct new unit of the national park system, managed by the OST under the administration of the NPS. The unit would be managed in a way consistent with the laws and policies of the NPS and guided by the Tribal laws and resolutions of the OST. The OST would be responsible for the administration and the day-to-day on-site operations. The OST would be responsible for operation of the visitor facilities and services. The LHEC would be the primary visitor center contact area for the park and an important component of visitor experience. The OST would be responsible for training and development of staff and volunteers. Technical assistance from the NPS would be available if requested, as funding permits.

A new agreement would be established between the OST and the NPS to clarify administrative and procedural details

necessary for the management of the distinct national park as a unit of the national park system. The agreement would also contain a park staffing plan, organizational plan, and business plan that would be prepared by the OST in close coordination with the NPS. When completed, the agreement would be submitted to both the OST Tribal Council and the regional director of the Midwest Region for concurrence before routing to the NPS Director for approval.

The national park would be identified by signs featuring the OST symbol and the NPS arrowhead. There would be signs along the major roads (I-90; US 385; Routes 73, 44, and 79; and BIA Route 2) to direct visitors into the Tribal Park. The national park would no longer receive a percentage of the entrance fee gate receipts collected in the North Unit of Badlands National Park, but would have a separate entrance fee for the national park. This revenue, along with a separate annual funding appropriation from Congress, would be used to manage and operate the national park. In addition, the national park could compete for funds and technical assistance within the established NPS fund and technical assistance allocation process.

The site superintendent/manager, who would report to the Midwest Regional Director, would be selected by the OST and would be responsible for both the administration and the day-to-day on-site activities at the national park. The Tribal national park manager would be responsible for management of the park consistent with the terms and conditions of the agreement.

Resources would be managed to perpetuate and protect the natural environment and preserve cultural resources, following the ordinances and regulations established by the OST and the policies pertaining to units of the national park system. Hunting would be permitted for Tribal members only, as regulated by the OST. The OST and the NPS would be responsible for

implementation of the South Unit GMP/EIS.

Option 5 would require congressional action to reestablish the South Unit as a distinct Tribal National Park managed by the OST under the administration of the NPS.

Option 6: Deauthorization. In option 6, the South Unit would be deauthorized by Congress, and the management of the land returned to the OST. The former site would be managed in whatever manner the OST selected, and the OST would be responsible for all costs associated with the management and operation of the former South Unit. The 1976 Memorandum of Agreement would be replaced and funding assistance from the NPS would cease. Funding would be the responsibility of the OST. The South Unit would no longer be a component of the national park system. The effect on the LHEC project is unclear.

Option 6 would require congressional action to deauthorize the South Unit.

Option 7: Oglala Sioux Tribal Park

Option 7 provides for the eventual deauthorization of the South Unit and return of its management to the OST as a Tribal Park. In this option, the NPS would provide increased training and education of OST members over an established period of time, with the ultimate goal of having the OST manage the unit as a Tribal Park. In order to provide for the training and development of future Tribal Park employees, the OST and/or the NPS could establish programs with local and regional colleges, as well as local high schools, to allow OST members to be educated and trained in all aspects of resource management. This option would also allow OST members access to NPS training programs.

The implementation of this option would begin with the execution of an agreement, reviewable on an annual basis, between the NPS and the OST that establishes clear decisions and achievable benchmarks for

each party in terms of training and educational opportunities and practical experience in park management. As benchmarks are achieved, additional management responsibility would shift to the Tribe as site manager. Opportunities for funding would come from the OST and the NPS working in concert. The agreement document would provide for preferential hiring of enrolled Tribal members. The effect on the LHEC project is unclear.

Option 7 would require congressional action to deauthorize the South Unit as a part of Badlands National Park.

THE ALTERNATIVES

This draft *South Unit General Management Plan / Environmental Impact Statement* (South Unit GMP/EIS) presents four resource and visitor experience alternatives for the future management of the South Unit of Badlands National Park. The four alternatives presented here embody the range of input from the public and the National Park Service with regard to visitor experience/access, natural resource management, cultural resource management, user capacity, and facilities management and development at the South Unit. The alternatives describe how natural and cultural resources and visitor uses will be managed. The alternatives consist of alternative A, the No-Action Alternative (continue current management); alternative B (expand interpretive opportunities); alternative C (focus on resource protection/preservation); and alternative D, the preferred alternative (protect resources while expanding interpretive experience).

Regardless of which management option is selected, both parties (NPS and OST) agreed that the resource and visitor experience alternatives are reasonable and should be addressed as an issue separate from the management options. In essence, whoever is ultimately responsible for managing the South Unit will be responsible for seeing that the direction specified in the final South Unit GMP/EIS is carried out accordingly.

The No-Action Alternative (Alternative A)

The No-Action Alternative primarily reflects current conditions and activities at the South Unit. This alternative is provided as a baseline against which to compare the action alternatives. Management zones, which are prescriptive (that is, they describe desired conditions for the future), would not be applied for the No-Action Alternative. Resource management and visitor experience would remain much as they are now.

The key impacts associated with implementing the No Action Alternative would be in the areas of paleontological, ethnographic, and scenic resources, as well as park operations. Adverse impacts to paleontological resources would be caused primarily by the continued illegal removal of fossils from the South Unit by visitors and collectors, continued livestock trampling of fossils, and continued weathering and accelerated mass wasting (landslides). Alternative A would have the potential to result in long-term moderate adverse impacts on ethnographic resources due to continuing current management and access. Scenic resources would be adversely impacted due to community and commercial scale renewable energy development on the Pine Ridge Indian Reservation, which could have major adverse impacts on the scenic resources of the South Unit. Lack of a clear plan and management zones would lessen the effectiveness of existing staff and volunteers over time. This would result in adverse, long-term, moderate impacts to park operations.

Alternative B

Alternative B primarily focuses on restoration with expanded access and opportunities for visitors to the South Unit. Opportunities include interpretation of natural, cultural, and paleontological resources. Approximately 89 percent of the lands within the South Unit would be designated as Natural Area / Recreation Zone, which would represent the basic core or center of the park and the Palmer Creek Unit. This zone would include primitive campgrounds, backcountry patrol/equestrian facilities, and access by paved and unpaved

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pedestrian and horseback riding trails. Approximately 11 percent of the lands located along the western and southern border of the park would be designated as Development Zone. Developments such as small wayside parking areas and related facilities by design would be carefully tucked into the landscape so not to become obtrusive. Less than 1 percent of the park would be designated as Research Zone, located in the north central part of the park. Within this zone visitors would experience a highly controlled environment and possibly very limited opportunities to experience the value this zone offers.

The key impacts associated with implementing this alternative would be in the areas of wildlife, paleontological, archeological, and ethnographic resources, and visitor access and experience. Initiation of active restoration programs and integrated weed management strategies on disturbed areas would increase the amount of native habitat available to wildlife. Beneficial impacts to paleontological, archeological, and ethnographic resources would be caused primarily by the reduced illegal removal of these resources from the South Unit by visitors and collectors and increases in public education opportunities and inventories. Improvement of visitor access under alternative B would come from improvement of the local roads, construction of new parking lots, guided and unguided tours to the backcountry, increased camping opportunities, and improved signage on surrounding roads. The increase in the number of outlets where visitors could obtain information and the dispersed locations of these outlets would substantially improve visitor experience. There would be more opportunities throughout the park and vicinity for visitors seeking to drive/sightsee, hike, camp, and/or picnic, creating beneficial effects on such visitors. A clear plan of action and increased staff to implement those actions would result in highly effective park operations and coordination of partners and volunteers to protect resources and serve visitors.

Alternative C

Alternative C primarily focuses on preservation, protection, and restoration of natural and cultural resources. Access would be limited primarily to the perimeter of the South Unit of Badlands National Park. Opportunities include interpretation of natural, cultural, and paleontological resources. Approximately 21 percent of the lands within alternative C would be designated as Natural Area / Recreation Zone. This zone would be located on the southwest corner of the park and the Palmer Creek Unit. This zone would include primitive campgrounds, backcountry patrol/equestrian facilities, and access by unpaved pedestrian and horseback riding trails. Approximately 2 percent of the lands would be designated as Development Zone, which is located on the southeast side of the park. Approximately 77 percent of the park lands would be designated as Preservation Zone.

The key impacts associated with implementing this alternative would be in the areas of paleontological, archeological, and ethnographic resources, visitor access and experience, socioeconomics, and park operations. Beneficial impacts to paleontological, archeological, and ethnographic resources would be caused primarily by the reduced illegal removal of these resources from the South Unit by visitors and collectors and increases in public education opportunities and inventories. By improving access in the South Unit, alternative C would produce a beneficial effect on visitor access. The improvement in access would come from improvement of the local roads, guided tours into the backcountry, construction of new parking lots, increased camping opportunities, the development of interior pedestrian trails, and improved signage on surrounding roads. The increase in the number of outlets where visitors could obtain information and the dispersed locations of these outlets would substantially improve the visitor experience. A clear plan of action and increased staff to implement those actions would result in highly effective park operations and coordination of partners and volunteers to protect resources and visitors.

Preferred Alternative (Alternative D)

The Preferred Alternative focuses on restoration with expanded access and opportunities for visitors. Opportunities would include interpretation of natural, cultural, and paleontological resources. The preferred alternative would promote understanding of Oglala history, culture, and land management principles through education and interpretation. Visitor activities would be focused in a developed front country area that would provide a variety of opportunities around the perimeter while the interior of the South Unit would be managed as backcountry. Natural resources management would focus on surveys and research to provide data to support future restoration, interpretation, and educational activities. Cultural resources management would focus on protection and preservation of historical, spiritual, and ceremonial sites and materials.

In addition to the White River Contact Station, a visitor contact station would be developed on the west side of the South Unit. Approximately 90 percent of the lands within the park would be designated as Natural Area / Recreation Zone. This zone would include primitive campgrounds, backcountry patrol / equestrian facilities, and access by unpaved pedestrian and horseback riding trails. Approximately 10 percent of the lands would be designated as Development Zone, which is located on the western and southern of the park and includes the White River area on the southeast corner of the park. Less than 1 percent of the park would be designated as Research Zone, located in the north central part of the park. Within this zone visitors would experience a highly controlled environment and possibly very limited opportunities to experience the value this zone offers due to restrictions imposed.

The key impacts associated with implementing this alternative would be in the areas of paleontological, archeological, and ethnographic resources, visitor access and experience, socioeconomics, and park operations. The effects on paleontological resources under alternative D are anticipated to have a major beneficial effect. Illegal fossil collecting should

decrease as a result of increased law enforcement. Fossils would continue to be present throughout the park, and the park staff would continue to protect, interpret, and provide opportunities for scientific research on paleontological resources. Alternative D would have the potential to result in beneficial effects on ethnographic resources due to increased inventory and protection, and the addition of appropriate interpretation. By improving access in the South Unit, alternative D would produce a beneficial effect on visitor access. The improvement in access would come from the construction of two new entrance stations, improvement of the local roads, guided tours into the backcountry, construction of new parking lots, increased camping opportunities, the development of interior pedestrian trails, and improved signage on surrounding roads. The increase in the number of outlets where visitors could obtain information and the dispersed locations of these outlets would substantially improve the visitor experience. There would be slightly more opportunities throughout the park for visitors seeking to drive/sightsee, hike, camp, and/or picnic, creating beneficial effects on such visitors. A clear plan of action and increased staff to implement those actions would result in highly effective park operations and coordination of partners and volunteers to protect resources and serve visitors.

THE NEXT STEPS

After the distribution of the Draft General Management Plan / Environmental Impact Statement there will be a 60-day public review and comment period. Following the close of the comment period, the planning team will evaluate comments from other federal agencies, tribes, organizations, businesses, and individuals regarding the draft plan and incorporate appropriate changes into a Final General Management Plan / Environmental Impact Statement. The final plan will include letters from governmental agencies, any substantive comments on the draft document, and NPS responses to those comments. Following distribution of the Final General Management Plan / Environmental Impact Statement and a 30-day waiting period, a Record of Decision

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approving a final plan will be signed by the Midwest Regional Director. The Record of Decision documents the NPS' selection of an alternative for implementation.

With the signing of the Record of Decision, the NPS can then begin to implement the plan. A Record of Decision, however, does not guarantee that funding and staffing to execute the approved plan will be forthcoming. Budget restrictions, requirements for additional data or

regulatory compliance, and competing National Park System priorities can prevent immediate implementation of many actions. Full implementation of major or especially costly actions, including capital construction and staffing increases, might be completed years into the future. Therefore, if full funding is not immediately available, a phased approach for implementing the plan will be necessary.

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CHAPTER 1: Purpose of and Need for the Plan



Dear Reader,

You will find this General Management Plan (GMP), in one particular area, is uniquely different than any other GMP. This GMP is typical, in that it sets forth a 15-20 year plan for the resources and visitor use and experience, but unique in that it also proposes a transition from National Park Service (NPS) management to Lakota management by the Oglala Sioux Tribe (OST). Once the history of how the South Unit came to be incorporated into Badlands National Park is understood, it becomes possible to understand why promoting the "NPS idea" through tribal management is compelling and deserving of NPS and public support. The proposed transition to Oglala Sioux Tribal management is supported by, and will only be possible through, the Lakota commitment to stewardship of the land and natural resources. The stewardship commitment comes from a deeply held belief system that goes back to the Lakota creation story.

According to Lakota oral history, at the time of creation there was one world which is called the spirit nation, a second world called the root nation, a third world called the four-legged nation, and a fourth world, called two-legged nation. The fourth world includes human occupation, which is expressed through spirituality and ceremony; this identifies the ownership of the existing tribes of today. All these worlds are tied together with the Lakota language that is still spoken today. The Lakota belief system and stewardship commitment is fundamental to the successful management of a Tribal National Park. It is also consistent with the stewardship commitment and value system that fostered the creation of National Parks and the "National Park" idea.

As you read and evaluate this GMP, we hope that the opportunities for positive change and success will become apparent to you. While the past cannot be changed, there are times when it is appropriate to revisit decisions that were made. This proposal reflects an attempt to do so. In addition, this proposal creates an opportunity to build empowerment that assists tribal nations to forge their own future. It restores the government-to-government relationship and a commitment to partnering with Lakota communities. It creates an opportunity for the Lakota to continue to prosper by strengthening law enforcement, expanding education and employment opportunities for youth and adults, and building a stronger economic community.



Stephen G. Thede
Acting Superintendent
Badlands National Park

A handwritten signature in black ink, appearing to read "S. G. Thede".



Birgil Kills Straight
Executive Director
Oglala Sioux Parks and Recreation
Authority

A handwritten signature in black ink, appearing to read "Birgil Kills Straight".

A GUIDE TO THIS DOCUMENT

The South Unit *General Management Plan / Environmental Impact Statement* (South Unit GMP/EIS) is organized into six chapters plus appendixes. Each section is described briefly below.

Chapter 1: Purpose of and Need for the Plan describes the context for the entire document. It explains why the plan is being prepared and what issues it addresses. It provides guidance (e.g., park purpose, significance, fundamental resources and values, special mandates, and servicewide laws and policies) for the alternatives that are being considered. This chapter also describes how this plan relates to other plans and projects.

Chapter 2: Management Options is a discussion of the organizational options that were considered for management of and decision making in the South Unit of Badlands National Park (referred to as the South Unit).

Chapter 3: Alternatives, Including the Preferred Alternative includes a discussion of management zones, user capacity, and the four alternatives for managing resources and visitor experience in the South Unit. Mitigation measures for minimizing or eliminating impacts of some proposed actions are then described. A section on the environmentally preferred

alternative follows. A summary table of the alternatives is included at the end of the chapter. Summary tables of the range of treatments for historic properties and the environmental consequences of implementing the alternatives are also included in this chapter.

Chapter 4: Affected Environment describes areas and resources that would be affected by actions in the various alternatives: cultural resources, natural resources, visitor opportunities and use, wilderness character, regional socioeconomics, and National Park Service (NPS) operations. It also includes a discussion of impact topics that were dismissed from detailed analysis.

Chapter 5: Environmental Consequences analyzes the impacts of implementing the alternatives. Methods used to assess impacts are outlined at the beginning of the chapter.

Chapter 6: Consultation and Coordination describes the history of public and agency coordination during the planning effort; it also lists agencies and organizations who received copies of the document.

The **Appendixes** present supporting information for the document, along with bibliographic references and a list of the planning team and other consultants.

OVERVIEW OF THE SOUTH UNIT

The South Unit of Badlands National Park holds some of the region's most valued natural resources. It contains spectacular scenery, including table mesas offering sweeping panoramas, deep canyons, washes, ravines, and foreboding walls. It also claims large concentrations of mixed-grass prairie and numerous wildlife species.

The South Unit is administered to provide for the care, maintenance, and preservation of prehistoric, historic, scientific, and scenic interest; interpret the history of the Sioux Nation and Lakota people; and develop facilities that will provide for public use and enjoyment. Composed of two largely undeveloped and remote tracts of land, the South Unit offers an experience rich in the history and culture of the Lakota people and the natural heritage and scenery of the White River Badlands.

The South Unit is a landscape of great historical and spiritual significance to the Oglala Sioux. The South Unit is located in part within the Pine Ridge Indian Reservation as established in 1889. The South Unit includes the Palmer Creek Unit.

In 1942, the War Department took 341,725 acres from the Pine Ridge Indian Reservation to establish the Aerial Gunnery Range (Bombing Range) for training purposes during World War II. Most of the South Unit is located within the former Bombing Range.

The lands were acquired through declarations of taking filed in condemnation proceedings under the pressures of a wartime emergency. Individuals and families were forced to vacate the area on very short notice, and the value of the lands was at an all-time low as a result of the Depression. The acquisition of the Bombing Range increased competition for land in the area and inflated the price of replacement sites to the point that the relocated persons were not able to buy substitute land with the compensation they had been paid. In many cases, individuals were forced to dispose of their livestock because their rangeland had been taken. There is evidence that many of the Tribal members were told they

would be given preferential status to repurchase their lands at the end of the war.

In 1968, the range was declared excess by the U.S. Department of the Air Force and returned to the Oglala Sioux Tribe (OST), except for 2,486 acres, which were retained and are still managed by the U.S. Department of the Air Force. Several groups and organizations wanted part or all of this excess land. Many of the former owners, both Indian and non-Indian, wanted to repurchase the lands taken from them; the OST wanted to acquire all of the excess lands; the National Park Service (NPS) wanted to include much of the land in an enlarged Badlands National Monument; the U.S. Fish and Wildlife Service wanted an area set aside for preservation of endangered wildlife; and the U.S. Air Force wanted to exchange some of the excess land for Tribal land it was leasing in its tactical bombing range (Statement of Harry Anderson, Assistant Secretary of the Interior, before the Indian Affairs Subcommittee, August 1, 1967).

In 1968, Congress authorized a land swap between the Departments of Defense and the Department of Interior, creating the South Unit. The land exchange was subject to approval by the OST, but if the Tribe did not approve it, the lands previously held in individual trust would be disposed of under surplus property procedures and permanently lost to the Tribe. Only by surrendering management of the land to the NPS would the land be held in trust for the Tribe (Burnham 2000). In 1976, the Tribe granted an easement to the NPS to manage the lands of the South Unit as part of Badlands National Park.

In 1976, the NPS and OST entered into a Memorandum of Agreement expanding the Badlands National Park by establishing the South Unit (see appendix A). The addition of the South Unit to Badlands National Park has been a contentious issue among the residents of Pine Ridge Indian Reservation since it occurred.

Between 1982 and 1999, the North and South Units were managed under a Master Plan and

Development Concept Plan, but it became clear that a new plan would be needed to address issues and concerns confronting the park in the new millennium. Accordingly, in 1999, the NPS authorized the development of a new plan that would reevaluate the park's needs and desired future conditions for both the North and South Units of Badlands National Park.

In 2000, the NPS held public scoping meetings as the initial stage of work on a new general management plan (GMP). In 2002, disagreements arose between the NPS and OST regarding plans to complete paleontological activities in the South Unit, ultimately leading to a moratorium on such activities. The NPS, OST, and Bureau of Indian Affairs (BIA) entered into formal negotiations concerning the future management of the South Unit. At that time, the decision was made to continue the GMP process for the North Unit only and postpone the South Unit GMP until 2006.

In developing the South Unit GMP/EIS, the OST internal review and approval process shares equal consideration with the NPS process. OST participation should be viewed as a critical, parallel, and cooperative process that must occur throughout planning, development, approval, and execution of the South Unit GMP/EIS. Article V of the OST constitution permits the Tribal Council to consult with the NPS. The OST agreed to use the NPS / National Environmental Policy Act (NEPA) process to develop the South Unit GMP/EIS and develop a Lakota Heritage and Education Center (LHEC).

The OST charged the Oglala Sioux Parks and Recreation Authority (OSPRA) with the responsibility to work with the NPS on the South Unit GMP/EIS.

In June 2010, the OST Land and Natural Resources Committee passed a resolution recognizing that the Committee, OSPRA, and the NPS have begun work on the development of the South Unit GMP/EIS and a preferred alternative involving more active and culturally relevant Tribal management and a cultural heritage center.

The Committee resolved to support the process being used and to

- Support the South Unit GMP/EIS, pursuit of the preferred alternative, and the initiation of a public comment period.
- Acknowledge that the process of government-to-government consultation on the issue of the GMP has been initiated and charge the OSPRA to consult with the NPS throughout the South Unit GMP/EIS development process, and to keep the full Tribal Council apprised of developments as they occur so that final approval by the Tribal Council and the people will be well informed.

The OST Tribal Council met in June 2010 and approved the resolution.

BACKGROUND

PLANNING BACKGROUND

Park planning is a decision-making process, and general management planning is the broadest level of decision making for parks. GMPs are required for all units of the national park system and are intended to establish the future management direction of a park (*National Parks and Recreation Act* of 1978, P.L. 95-625). General management planning is the first phase of tiered planning and decision making for national park units. It focuses on why the park was established (its purpose), why it is special (significance, fundamental resources and values), and what resource conditions and visitor experience should be achieved and maintained (desired future conditions). GMPs look years into the future and consider a park holistically,

in its full ecological and cultural context, and as part of a surrounding region.

Although a GMP provides the analysis and justification for future funding, the plan in no way guarantees that money will be available. Requirements for additional data or legal compliance, and competing national park system priorities can delay implementation of actions. Full implementation of a plan may extend many years into the future.

This GMP/EIS was developed by an interdisciplinary team composed of staff of NPS offices and representatives of OSPRA, the Tribal entity delegated by the OST to work with the NPS on this GMP/EIS. The team consulted with other NPS and OST agencies and entities, other federal, state, and local agencies, and the general public.

PURPOSE AND NEED FOR THE GENERAL MANAGEMENT PLAN

The South Unit GMP/EIS provides comprehensive guidance for perpetuating natural systems, preserving cultural resources, and providing opportunities for quality visitor experiences at the South Unit. The purpose of the GMP/EIS is to ensure that park managers and the public share the same vision of how best to achieve the park's purpose and protect its resources unimpaired for future generations.

The South Unit GMP/EIS responds to a need to provide better management and preservation of the resources of the South Unit. The existing 1976 Memorandum of Agreement (described in the "Special Mandates" section later in this chapter) has proven to be inadequate to provide for these needs and is now badly outdated. Subsequent NPS plans for management have failed to produce an implementable program for resource preservation and improved visitor experiences. This new GMP/EIS will address resource conditions and visitor experience.

This GMP/EIS describes the general path for park managers to follow in managing the South Unit for the next 20 or so years. The plan does not provide specific and detailed answers to every issue facing the park. Rather, it is a framework to assist South Unit managers in making decisions today and into the future. The GMP/EIS will

- Provide general guidance for how best to manage natural and cultural resources and provide for visitor use.

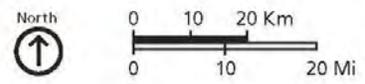
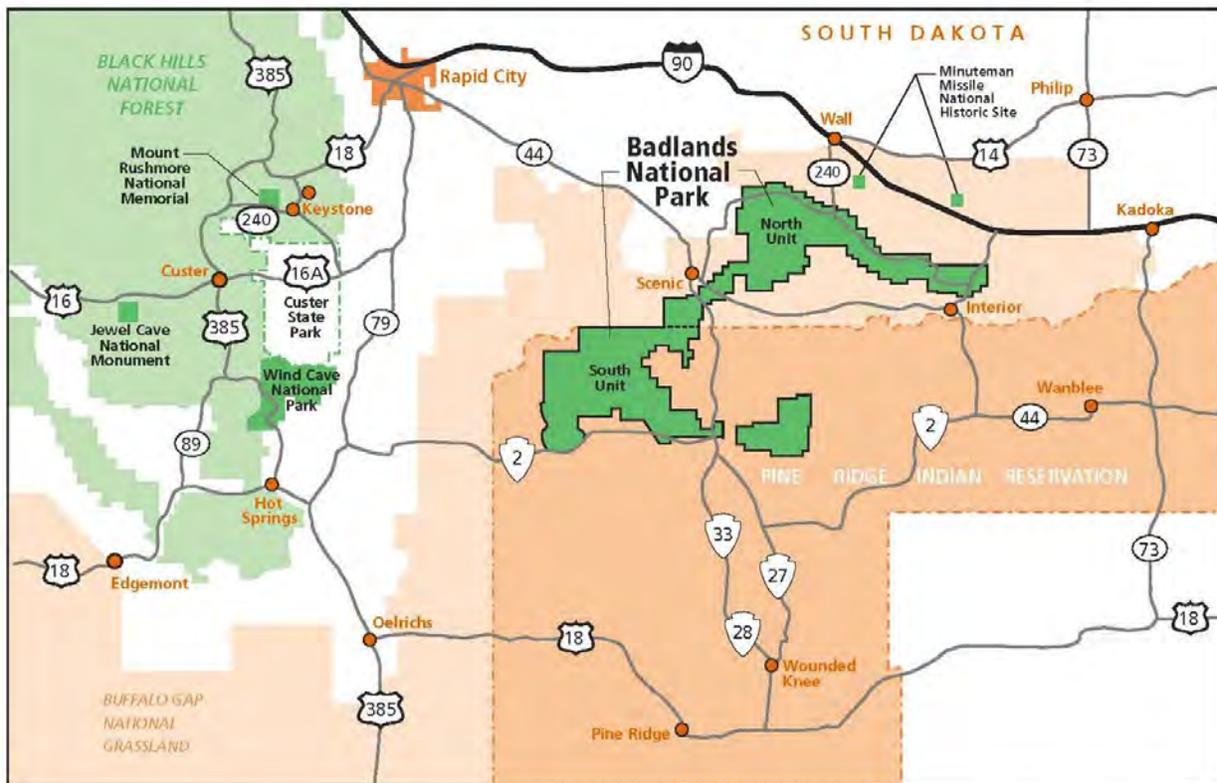
- Clearly define the resource conditions and visitor experience opportunities to be achieved.
- Present a general approach for facilities and access.
- Ensure that the foundation for decision making is developed in consultation with an interested public and adopted by South Unit management after sufficient analysis of the benefits, impacts, and economic costs of alternative courses of action.

This GMP/EIS is needed to guide the future management of the South Unit, ensure that park resources are preserved, and provide opportunities for a diversity of quality visitor experiences in the 21st century. The *Draft General Management Plan Revision / Development Concept Plan / Environmental Assessment for the Badlands South Unit* (NPS 1985) was prepared more than 20 years ago. The 1985 plan is outdated and does not provide a comprehensive plan for managing the South Unit and assisting park managers in making future decisions. Preparing this GMP/EIS has given the NPS an opportunity to reevaluate the unit's needs and the desired future conditions for the unit on the basis of the most current information and regional trends.

REGIONAL CONTEXT

Badlands National Park is one of nearly 400 authorized units of the National Park System. The South Unit is approximately 65 miles southeast of Rapid City, South Dakota. Most of the South Unit is bordered by Buffalo Gap National Grassland and the Pine Ridge Indian Reservation. Private lands, primarily ranches, also lie adjacent to the South Unit. Refer to the Vicinity map.

The Pine Ridge Indian Reservation, home to the OST, is the second-largest land-based reservation in the United States (3,469 square miles). The South Unit is on Tribal lands and is currently managed through an agreement between the OST and the NPS.



Vicinity Map
Badlands National Park
 United States Department of the Interior
 National Park Service

PLANNING ISSUES AND CONCERNS

The American public, the NPS, and the OST need to make many important and difficult decisions about the future of the South Unit and its resources, uses, and management. The public and the planning team identified a number of concerns facing the South Unit. The issues generally involve the following:

- The level of OST involvement in the management of the South Unit.
- Natural and cultural resource protection.
- Appropriate types and levels of use within the park.
- Maintaining access to the park.
- Development of appropriate facilities in the park.

These are complex issues, with no easy answers. People who care deeply about the South Unit often hold sharply divided opinions about how the issues should be resolved. In addition, tight budgets combined with increased visitation have put, and will continue to put, an increased strain on the ability of the NPS to maintain facilities, protect natural and cultural resources, provide interpretive and other visitor services, and enforce rules and regulations. The breadth of issues and concerns facing the South Unit illustrates the complexity and difficulty in determining how to manage park resources and visitors in the 21st century and beyond.

The public scoping and consultation process is detailed in chapter 6.

FOUNDATION FOR PLANNING AND MANAGEMENT

PARK PURPOSES FOR THE SOUTH UNIT

Purpose statements convey the reason(s) for which the national park unit was set aside as part of the national park system. Grounded in an analysis of park legislation (appendix B) and legislative history, purpose statements also provide primary criteria against which the appropriateness of South Unit GMP/EIS recommendations, operational decisions, and actions are tested. A park's purpose statement focuses the agency's management role at a particular park unit but does not supersede the NPS *Organic Act* (see "Servicewide Laws and Policies" section in this chapter).

The purposes of the South Unit are based on the purposes in the various pieces of legislation that created Badlands National Park as well as an understanding of the importance of the South Unit to the OST. In light of the need to focus attention on the management of the South Unit, the planning team recognizes that the South Unit of Badlands National Park was established to accomplish the following:

- Preserve and interpret the history, culture, and heritage of the Sioux Nation and Lakota people.
- Preserve and interpret the archeological and contemporary history of use and settlement of lands within the park.
- Protect the unique landforms and scenery of the White River Badlands for the benefit, education, and inspiration of the public.
- Preserve, interpret, and provide for scientific research of the paleontological and geological resources of the White River Badlands.
- Preserve the flora, fauna, and natural processes of the mixed-grass prairie ecosystem.

PARK SIGNIFICANCE FOR THE SOUTH UNIT

Significance statements capture the essence of the national park unit's importance to the nation's natural and cultural heritage. They describe the unit's distinctiveness and describe why an area is important within regional, national, and global contexts. This helps managers focus their efforts and limited funding on protection and enjoyment of attributes that are directly related to the purpose of the park unit. The significance and unique characteristics of Badlands National Park that relate to the South Unit are as follows:

- The park's geological and paleontological resources provide insight into climatic history, biological diversity, evolution, and geological processes particular to the boundary between the Eocene and Oligocene epochs.
- Fossil and geologic records provide a unique opportunity to trace the evolution of the prairie ecosystems of the Great Plains.
- The park contains places of spiritual and historical significance to the Oglala people, including the site of one of the last Ghost Dances, which precipitated the 1890 massacre at Wounded Knee.
- The long history of research in the White River Badlands has contributed greatly to the science of vertebrate paleontology in North America.
- The park contains a substantial remnant of native prairie and mixed-grass prairie.
- The park contains large prairie dog colonies that could provide habitat for the endangered black-footed ferret.
- The park contains spectacular scenery, predominantly highly eroded landforms that comprise a concentrated collection

of rutted ravines, serrated towers, pinnacles, and precipitous gulches.

PRIMARY INTERPRETIVE THEMES

Primary interpretive themes are the most important ideas and concepts communicated to the public about the park. They are the core of all interpretive programs and media provided to park visitors. The *Badlands Master Plan and Development Concept Plan* identifies the following primary interpretive themes:

- The Badlands fossil and geological record reflects changing climates and the great diversity of species existing during various periods; its study provides insight into the survival of species.
- Different cultural groups from historic to present-day American Indians and allottees have had and continue to have spiritual and physical relationships to the resources of the Badlands.
- One of the last Ghost Dances occurred on Stronghold Table and precipitated the 1890 Wounded Knee Massacre, which was the last battle between American Indians and Europeans.
- Families who historically lived on this land sometimes faced difficult choices and made sacrifices when the Bombing Range was created.
- Studying the mixed-grass prairie ecosystem and the human relationship to it helps to understand the changing grassland ecology of the Great Plains and helps us restore and protect this fragile and remarkably diverse ecosystem.
- The Badlands, an evolving landscape formed by the processes of deposition and erosion and forces of the wind and water, offers lessons for all visitors on the impacts of natural forces on our communities and our lives.
- The Badlands offer excellent possibilities for solitude and

contemplation and an unusual opportunity to experience wildness in a prairie setting.

- The science of vertebrate paleontology was born in the Badlands region; paleontology and other forms of science continue to evolve and play an important role in the management of Badlands National Park.

SPECIAL MANDATES

Special mandates are legislative or judicial requirements that are specific to a particular unit of the national park system. They are typically mandated by Congress or by the courts. Special mandates for the South Unit are listed below.

Authorizing Legislation

Congress authorized the creation of Badlands National Monument in 1939 “for the benefit and enjoyment of the people” (45 Stat. 1553). This establishing legislation required the state of South Dakota to acquire certain lands and construct a scenic road to provide public access. Those conditions were met in 1939, and Badlands National Monument was established by presidential proclamation (53 Stat. 2521).

Public Law 90-468 (82 Stat. 663), enacted on August 8, 1968, expanded the boundaries of the monument by authorizing the acquisition of lands of outstanding scenic and scientific character, but limited the total monument area to 242,756 acres. The lands, which were in the Pine Ridge Indian Reservation, were used by the U.S. Air Force as a bombing range. Under the provisions of this act and the subsequent Memorandum of Agreement (1976) between the OST and Secretary of the Interior, 133,300 acres of land in the reservation were added to the monument. The national monument was re-designated as Badlands National Park in 1978. The lands in the reservation, which remain Tribal lands, are administered by the NPS as the South Unit of Badlands National Park. The Memorandum of Agreement between the Secretary of the Interior and the OST provides further guidance on the management of the South Unit.

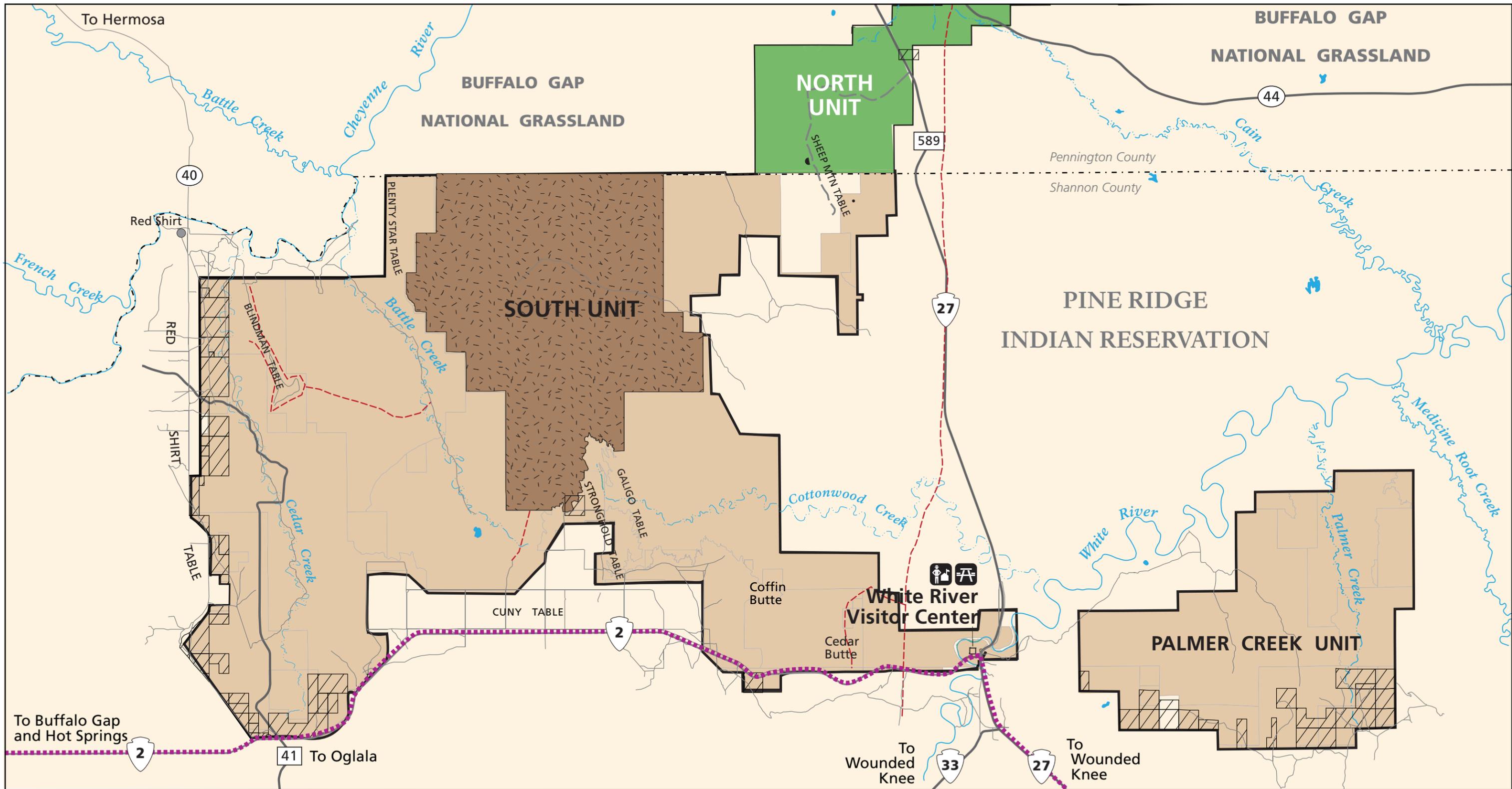
Treaty Rights

The South Unit is located within the Pine Ridge Indian Reservation, home to the Oglala Sioux. The alternatives being considered in this document will not affect any existing Tribal treaty rights.

Bureau of Indian Affairs Range Unit Management

Almost every range unit on the South Unit is leased for livestock use by the BIA. Only one

range unit is leased by the OST Land Office. Leasing is conducted on an allocation basis and renewed every five years without competition. Families could lease the land for a lifetime through the allocation process, which results in multiyear family leases. This intergenerational ability to lease the land creates an expectation of a continued property interest. This will be an important consideration in enacting South Unit park management practices. Refer to the “Leased Grazing Lands within the South Unit” map on the next page.



Pine Ridge Indian Reservation Boundary	Park North Unit	Ranger station
Crazy Horse Scenic Byway	Park South Unit	Restrooms
Unpaved road	Private Lands	Picnic area
Unpaved road (passable only when dry)	Range Unit 505	Self-guiding trail
Paved road	BIA Leased Grazing Lands	Campground
Trail	OST Leased Grazing Lands	Primitive Campground

North ↑

0 1 Kilometer 5
0 1 Mile 5

LEASED GRAZING LANDS
WITHIN BADLANDS SOUTH UNIT

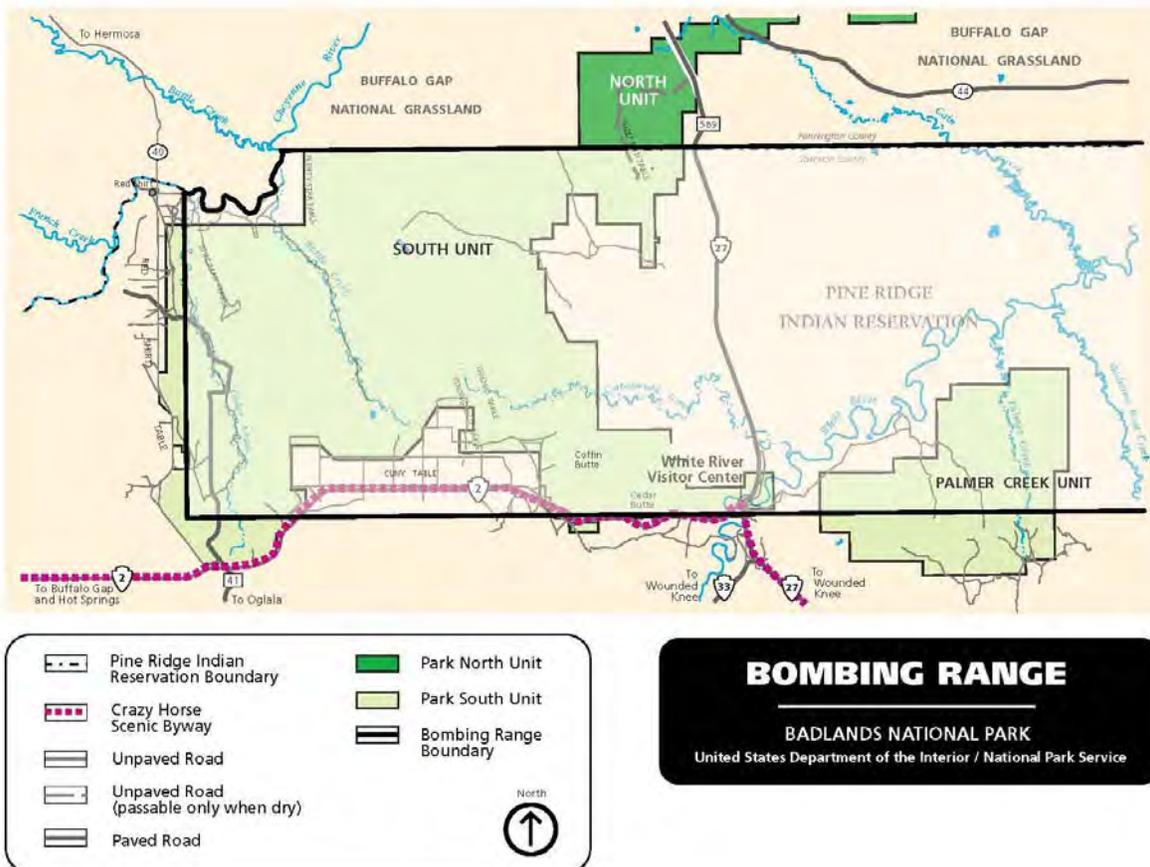
BADLANDS NATIONAL PARK
United States Department of the Interior / National Park Service

Bombing Range

In 1942, the War Department took 341,725 acres from the Pine Ridge Indian Reservation to establish the Aerial Gunnery Range (Bombing Range) for training purposes during World War II. In 1968, the range was declared excess by the U.S. Department of the Air Force. Most of that land was returned to the OST. A vast majority of the South Unit is located within the Bombing Range. The cleanup of the former Bombing Range is an ongoing effort by the U.S. Army Corps of Engineers (USACE) and the OST to identify and mitigate public safety concerns relating to the former military use of these lands. The South Unit will probably never

be cleared of unexploded ordnance with today's technology, but some of the more used and passable roads within the South Unit should be cleared in the next few years pending available funding and right of entry from the OST. Refer to the Bombing Range map.

Due to the quantity of unexploded ordnance that continues to litter the areas formally used for bombing practice, visitors are advised to stay on the existing road and trails for their safety. If visitors encounter possible unexploded ordnance or munitions and explosives of concern, they should leave the vicinity and contact emergency services.



SERVICEWIDE LAWS AND POLICIES

Many park management directives are specified in laws and policies guiding the NPS and are therefore not subject to alternative approaches. For example, there are laws and policies about managing environmental quality (such as the *Clean Air Act*, the *Endangered Species Act*, and Executive Order 11990, Protection of Wetlands); laws governing the preservation of cultural resources (such as the *National Historic Preservation Act* and the *Native American Graves Protection and Repatriation Act*); laws protecting paleontological resources (the *Paleontological Resources Preservation Act*); and laws about providing public services (such as the *Americans with Disabilities Act*), to name only a few. In other words, a GMP is not needed to decide that it is appropriate to protect paleontological resources or endangered species, control exotic species, protect historic and archeological sites, conserve artifacts, or provide for access for disabled persons. Laws and policies have already decided those and many other things. Although attaining some conditions set forth in these laws and policies may have been temporarily deferred in the park because of funding or staffing limitations, the NPS will continue to strive to implement these requirements with or without a new GMP. The South Unit GMP/EIS is critical in providing guidance for complying with laws and policies.

There are other laws and executive orders that are applicable solely or primarily to units of the national park system. These include the 1916 *Organic Act* that created the NPS; the *General Authorities Act* of 1970; the act of March 27, 1978, relating to the management of the national park system; and the *National Parks Omnibus Management Act* (1998).

The NPS *Organic Act* (16 United States Code (USC) 1) provides the fundamental management direction for all units of the national park system:

[P]romote and regulate the use of the Federal areas known as national parks, monuments, and reservations ... by such means and measures as conform to the fundamental purpose of said parks ... which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

The NPS *General Authorities Act* (16 USC 1a-1 et seq.) affirms that while all national park system units remain “distinct in character,” they are “united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage.” The act makes it clear that the NPS *Organic Act* and other protective mandates apply equally to all units of the system. Further, amendments state that NPS management of park units should not “derogate[e] ... the purposes and values for which these various areas have been established.”

The NPS also has established policies for all units under its stewardship. These are identified and explained in a guidance manual entitled *NPS Management Policies 2006* (NPS 2006b). The action alternatives considered in this document (alternatives B, C, and D (the preferred alternative)), as well as the No-Action Alternative (alternative A, continuation of current management), incorporate and comply with the provisions of these mandates and policies. NPS laws and policies are described further in appendix C.

OTLALA SIOUX TRIBAL LAWS, RESOLUTIONS, AND ORDINANCES

OST resolutions and ordinances that would apply to managing the South Unit are briefly described in appendix C.

DESIRED CONDITIONS AND STRATEGIES

This section focuses on management principles and strategies to guide management of the South Unit in all alternatives, including the No-Action Alternative. The principles and strategies guide actions taken by park managers on such topics as natural and cultural resource, park facilities, and visitor use management. Each topic discussed below has two parts: desired conditions for that topic, and broad strategies that may be used to achieve those desired conditions.

Desired conditions articulate the ideal conditions the NPS and OST are striving to attain. The term “desired conditions” is used interchangeably with “goals.” Desired conditions provide guidance for fulfilling the park’s purpose and for protecting the park’s fundamental resources and values on a unit-wide basis.

A number of guiding principles and strategies are described below. These are based on mandates and NPS policies that would continue to shape the way in which the South Unit is managed under the alternatives being considered in this GMP/EIS. All the alternatives support the purposes and significance of Badlands National Park. Some of these principles and strategies describe approaches currently being taken by park staff. Other principles and strategies are not being implemented at present, but are consistent with NPS policy, and are not controversial, and implementation would require no additional analysis under NEPA. This is not an exhaustive list of strategies. As new ideas, technologies, and opportunities arise, they will be considered if they further support the desired condition.

The unit-wide desired conditions and strategies in this section, combined with the management actions that are specific to the management option ultimately selected for implementation (see chapter 2), will form the complete GMP/EIS for the South Unit.

As described further in chapter 2, the NPS, the OST, or some combination of the two will manage the South Unit. The NPS and the OST have agreed that the entity ultimately responsible for managing the South Unit will be

responsible for carrying out the direction specified in the final GMP/EIS. If the OST becomes the park manager, the OST will coordinate with the NPS on the strategies and principles described in this section. Conversely, if the NPS continues as the park manager, the NPS will coordinate or consult with the OST on the strategies and principles described in this section.

ECOSYSTEM MANAGEMENT

Approaches to ecosystem management are varied and occur at many levels. To achieve the desired future conditions described for park resources, a regional perspective must be considered, and it must be recognized that actions taken on lands surrounding the park directly and indirectly affect the park. Many of the threats to park resources, such as invasive species and air pollution, come from outside the park boundaries. An ecosystem approach is required to understand and manage the park’s natural resources. An understanding of the health and condition of the ecosystem is imperative.

Cooperation, coordination, negotiation, and partnerships with agencies and neighbors are crucial to meeting or maintaining the desired future conditions for the park. This approach to ecosystem management may involve many parties or cooperative arrangements with federal and state agencies, tribes, or private landowners to obtain a better understanding of trans-boundary issues.

The park is managed holistically as part of a greater ecological, social, economic, and cultural system. The following strategies will allow park managers to lead in resource stewardship and in the conservation of ecosystem values within and outside the park. These strategies will allow park managers to maintain good relations with owners of adjacent property, surrounding communities, and private and public groups that affect and are affected by the park. The strategies also will allow proactive management of the park designed to resolve external issues

and concerns and to ensure that park values are not compromised.

Strategies

Park managers will use the following ecosystem management strategies:

- Seek agreements with the U.S. Forest Service and other owners of adjacent property to protect the Badlands ecosystem.
- Work cooperatively to manage nonnative species in the region.
- Act as a partner with the research community to further the knowledge of the natural and cultural resources of the park.
- When feasible, seek partnerships with other public and OST agencies and share orientation, contact stations, and administrative facilities.
- Work with partners to protect species of concern and reintroduce extirpated native species when practical.

RELATIONSHIPS WITH PRIVATE AND PUBLIC ORGANIZATIONS, OWNERS OF ADJACENT LAND, AND GOVERNMENT AGENCIES

Park managers must consider that the South Unit—socially, politically, ecologically, and historically—is part of a greater area and that actions in the South Unit affect the surrounding environment and society. For instance, the management of the park influences local economies through tourism expenditures and the goods and services the park purchases to support operations.

Strategies

Park managers will use the following strategies related to actions that affect the surrounding environment and society:

- Establish partnerships with public and private organizations to achieve the purposes and mission of the park. Seek partnerships for the purposes of resource

protection, research, education, visitor enjoyment, visitor access, and management.

- Foster a spirit of cooperation with neighbors and encourage compatible uses of adjacent lands, inform landowners, land managers, neighboring tribes, local governments, and the public about park management activities. Periodically consult with landowners and communities that are affected by or potentially affected by park visitors and management actions.
- Work closely with local, state, and federal agencies and Tribal governments whose programs affect or are affected by activities in the South Unit. In particular, to meet mutual management needs and maintain a close working relationship with the U.S. Forest Service and the owners of adjacent private land.

RELATIONSHIPS WITH AMERICAN INDIANS

The Badlands area in general and the South Unit in particular have long occupied a prominent position for American Indians in the Great Plains. Park managers will work to ensure that traditional American Indian ties to the South Unit are recognized and the park's cultural significance protected. Park managers will strive to maintain positive, productive government-to-government relationships with the tribes who have current or ancestral ties with the White River Badlands area.

Strategies

Park managers will use the following strategies to enhance relationships with American Indians:

- Consult regularly and maintain government-to-government relations with federally recognized tribes that have current or ancestral ties to resources within the park to ensure productive, collaborative working relationships.
- Identify and deepen the understanding of the significance of the park's

resources and landscapes to American Indian peoples through collaborative research and sharing.

- Once identified, protect and preserve the sites, resources, landscapes, and structures of significance to federally recognized tribes.
- Encourage the participation of these tribes in protecting the park's natural and cultural resources.
- Involve the tribes in the park's interpretation program to promote accuracy of information about American Indian cultural values and to enhance public appreciation of those values.
- Support the continuation of traditional American Indian activities in the park to the extent allowed by applicable laws and regulations.
- Consult and collaborate with tribes concerning issues and proposed actions that might affect American Indians.

MANAGING AND PROTECTING NATURAL RESOURCES

The protection, study, and management of the park's natural resources and processes is essential for achieving the park's purposes and mission goals. The following principles and strategies will help the park managers to retain the ecological integrity of the South Unit, including its natural resources and processes. These actions will help ensure that the South Unit's natural features are unimpaired; the park continues to be a dynamic, biologically diverse environment; and the South Unit is recognized and valued as an outstanding example of resource stewardship, conservation, education, and public use.

Inventory and Monitoring

Knowing the condition of natural resources in a park is fundamental to a park manager's ability to protect and manage parks. The South Unit is confronted with increasingly complex and challenging issues, and the park staff needs

scientifically credible data to make management decisions. Inventories involve compiling existing information as well as collecting new information. Inventories contribute to a statement of the condition of park resources in relation to a standard condition, especially the natural or unimpaired state.

A long-term ecosystem monitoring program is necessary to enable managers to make better informed decisions, to provide early warning of changing conditions in time to develop effective mitigation measures, to convince individuals and other agencies to make decisions benefiting the park, to satisfy legal mandates, and to provide reference data for relatively pristine sites for comparison with areas outside of the park. Monitoring also enables park staff to evaluate the effectiveness of management actions and obtain more accurate assessments of progress toward management goals. Using monitoring information will increase confidence in managers' decisions and improve their ability to manage park resources.

Strategies

Park managers will use the following inventory and monitoring strategies:

- Develop inventories and long-term monitoring programs to address the status and health of the park. Develop key indicators and monitor resource or ecosystem conditions over the long term to record ecosystem health.
- Conduct inventories to identify vertebrate and invertebrate animal species, vascular and nonvascular plant species, and air, water, and geologic resources in the park.
- Participate in the Northern Great Plains Inventory and Monitoring Network. Work with partners and collaborators to inventory resources and monitor vital components of the ecosystem. This will make it possible to better assess the condition of park resources and trends and develop databases, data analyses, and retrieval tools so that the usefulness of natural resource information can be improved.

Air Quality

Badlands National Park is designated a Class I area under the *Clean Air Act*. This designation permits the least degradation of air quality and air quality-related values, including visibility. The following policies and strategies will ensure that the South Unit's air quality will be enhanced or maintained with no significant degradation, and that nearly unimpaired views of the landscape both within and outside the park are available.

Strategies

Park managers will use the following strategies related to air quality and visibility:

- Strive to set a global example of how Class I areas and critical air sheds can be effectively protected.
- Reduce emissions associated with administrative and recreational use of the park.
- Expand baseline information about air quality-related values through research, inventory, and monitoring programs to identify human stressors and general air quality trends.
- Expand programs for sharing air quality information with surrounding agencies and develop educational programs to inform visitors and regional residents about the threats of air pollution to park resources.
- Continue to participate in regional air quality planning, research, and the implementation of air quality standards.
- Protect the park's noteworthy night sky as a natural and cultural resource and as an inspiration for visitor enjoyment.

Natural Sound

Due to its remote location, natural sound predominates in the South Unit. Visitors have the opportunity throughout most of the unit to experience natural sounds. The sounds of modern society are generally confined to developed areas in the surrounding locality.

Strategies

Park managers will use the following strategy related to natural sound:

- Protect the South Unit's natural sounds to the extent possible as an inspiration for visitor enjoyment.
- Reduce sound associated with administrative and recreational use of the park.

Fire Management

Prescribed and wildland fire will be used as a tool to meet park management objectives.

Strategies

Park managers will use the following strategies to ensure that wildland fire will be used in an effective manner to protect park resources:

- Develop and maintain a current fire management plan for the park.
- Collaborate with adjacent communities, groups, state and federal agencies, and tribes to manage fire in the park and the region.
- Support national, regional, and local fire management activities and provide public education on the role of fire management in its historic and ecological context.
- Use fire to maintain and restore native prairie and control nonnative plant species.

Geologic Features

Badlands National Park was established to protect the unique landforms of the area.

Strategies

Park managers will employ the following policies and strategies to ensure that the South Unit's geologic features are not significantly degraded and the scenic views remain unimpaired:

- Inventory, map, and monitor geologic features to assess their condition.

- Allow natural geologic processes to proceed unimpeded.
- Develop interpretive and educational programs to educate visitors and the public about geology.
- Allow intervention in natural geologic processes only when directed by Congress; when necessary in emergencies that threaten human life and property; when there is no other appropriate way to protect natural resources, park facilities, or historic properties; to provide appropriate visitor services; or when an intervention is necessary to restore impacted conditions and processes.
- Actively seek to understand and preserve the park's soil resources and prevent to the extent possible their physical removal or contamination.
- Monitor high-impact visitor use areas and take actions to reduce impacts on geologic and paleontological resources.

Paleontological Resources

The South Unit contains outstanding paleontological resources that have added to the understanding of climatic history, biological diversity, evolution, and geologic processes.

Strategies

The following strategies will be implemented to better understand paleontological resources:

- Expand inventory and monitoring processes to document the status and rate of loss for these nonrenewable resources.
- Develop a paleontological salvage program to ensure these resources are not lost.
- Manage and study paleontological resources in their geologic context, which provides information about the ancient environment.
- In consultation with the Tribal Historic Preservation Office, partner with other

national parks; federal, state, Tribal, and local agencies; and academic institutions, including Oglala Lakota College, to conduct paleontological research in the South Unit.

- Develop interpretive and educational programs to educate visitors and the public about paleontology.
- Manage all fossils collected from the South Unit in accordance with Tribal and NPS research permitting systems and through agreement and consultation with the OST.
- In consultation with the other national parks, museums, and universities, develop fossil exhibits, fossil preparation facilities, and storage facilities according to Tribal and NPS museum standards.
- In consultation with other national parks, museums, and universities, develop a mentoring program for young paleontologists, involving internships and school programs focusing on field, lab, and museum activities.
- Expand opportunities for researchers to use the park's fossil collection to further paleontological knowledge.

Threatened or Endangered Species

The *Endangered Species Act* mandates that agencies promote the conservation of all federally listed threatened or endangered species and their critical habitats within park boundaries. Several federally listed and state-listed threatened or endangered species are known to exist in and around Badlands National Park and use habitats within the park.

Strategies

Park managers will take the following actions to protect threatened or endangered species:

- Work with the USFWS and South Dakota state agencies to ensure that the park's actions help special-status species (state-listed or federally listed threatened, endangered, rare, declining,

sensitive, candidate, or special concern species, and Tribal species of concern) to recover. If any state-, Tribally, or federally listed or proposed threatened or endangered species are found in areas that would be affected by construction, visitor use, or restoration activities proposed under any of the alternatives in this GMP/EIS, consult with the appropriate agencies and try to avoid or mitigate any potential adverse impacts to any state-, Tribally, or federally listed special-status species.

- Cooperate with the USFWS and South Dakota state agencies to inventory, monitor, protect, and perpetuate the natural distribution and abundance of all special-status species and their essential habitats in the South Unit. Specifically consider these species in ongoing planning and management activities.
- Work with the USFWS, U.S. Forest Service, and South Dakota state agencies in the recovery of the black-footed ferret, one of North America's most endangered mammals.

Vegetation

Plant communities and the processes governing them will continue unaltered in most of the park. Communities will include the diverse species, genetic variability, plant associations, and successional stages representative of an ecologically functioning system in the Great Plains.

Strategies

Park managers will take the following actions to manage the park's vegetation:

- Inventory plant communities to determine the species present and monitor to assess their condition. Inventory rare plants.
- Begin efforts to eradicate invasive exotic (nonnative) plants in the park. Continue to work with state and local agencies and private landowners to

prevent the spread of exotic plant species into and out of the park.

- Use fire as a management tool where appropriate for maintaining plant communities.

Wildlife and Fish

The condition of wildlife and fish will be determined through baseline inventories and long-term monitoring programs.

Strategies

Park managers will employ the following policies and strategies to ensure that the park's wildlife and fish are protected:

- Seek to perpetuate the native animal life as part of the natural ecosystem. Emphasize minimizing human impacts on native animals and minimizing human influence on naturally occurring fluctuations of animal populations. Rely on ecological processes to control the populations of native species to the greatest extent practicable.
- Ensure the preservation of populations and habitats of migratory species inhabiting the park, such as birds and mountain lions. Whenever possible, cooperate with others to ensure the preservation of the populations and habitats of migratory species outside the park.
- Develop educational programs to inform visitors and the general public about wildlife issues and concerns.
- Undertake the management of populations of native or exotic animal species whenever such species threaten park resources, public health, or park neighbors and when control is prudent, feasible, and appropriate.
- Work to restore extirpated native species where suitable habitat exists and where it is compatible with social, political, and ecological conditions.

Managing and Protecting Cultural Resources

The protection of the South Unit's cultural resources is essential for understanding the past, present, and future relationship of people with the area. The strategies mentioned below will enable park managers to protect the South Unit's cultural resources. At the same time, these strategies will encourage visitors and employees to recognize and understand the value of the South Unit's cultural resources and allow their integrity to be preserved unimpaired.

Archeological, Historic Structures, Cultural Landscapes, and Ethnographic Resources

Strategies

Park managers will employ the following strategies for managing cultural resources:

- Survey or document or inventory cultural resources in accordance with the *National Historic Preservation Act* and following best management practices indicated by the Secretary of Interior's standards and associated regulations, policies, standards, and guidelines.
- Gather field data regarding archeological resources to develop a more accurate predictive model of prehistoric site distribution and to address related research questions.
- Monitor archeological site conditions.
- Evaluate all identified resources in accordance with the eligibility criteria for the National Register of Historic Places.
- Use avoidance techniques and other measures to prevent impacts on known significant sites from visitors and project-related disturbances.
- Support research and consultation to increase the understanding of all cultural resources.
- As appropriate, consult federally recognized tribes and Tribal Historic Preservation Officers on surveys,

studies, excavations, and actions that could affect cultural resources.

Museum and Archival Collections

Strategies

Park managers will use the following strategies for managing museum and archival collections:

- At present, all park museum specimens are housed off site. With the construction of the LHEC, a museum storage facility would be included. Where feasible and appropriate, transfer any museum materials collected from the South Unit and housed off site to the LHEC facility. Where feasible, make casts of fossils and artifacts to be placed on display. Make efforts to develop a diverse museum collection. The collection would contain historic artifacts; biological, paleontological, and geological specimens; historic images; archival materials; and prehistoric and historic archeological specimens and artifacts.
- Develop and maintain the condition of artifact and specimen exhibits and storage according to OST and NPS standards.
- Provide opportunities for researchers to use the artifacts, specimens, and archival materials in the museum collection.

Orientation, Interpretation, and Education

A variety of methods are used to orient visitors to Badlands National Park, provide information about the park, and interpret the park's resources. Park managers will pursue strategies to ensure that information is available so that visitors can plan a rewarding visit to the South Unit. Outreach and educational programs will help connect diverse audiences with the park's resources, build a local and national constituency, and gain public support for protecting the park's resources. Providing interpretation opportunities will build emotional, intellectual, and recreational ties with the park and its cultural and natural heritage.

Strategies

Park managers will use the following orientation, interpretation, and education strategies:

- Place emphasis on providing information, orientation, and interpretive services in the most effective manner possible. Use appropriate techniques and technologies to increase the visibility of the park and its programs and make people aware of issues facing the South Unit.
- Enhance cooperative efforts and partnerships with local communities, public and private agencies, organizations, stakeholders, and land managers in the region so that visitors can be better informed about the abundance, variety, and availability of the region's recreational and interpretive opportunities. This information will orient visitors about what to do (and what not to do), attractions to see, and how to enjoy the park in a safe, low-impact manner.
- Strengthen partnerships with state parks and other national parks, educational institutions, and other organizations to enrich interpretive and educational opportunities regionally and nationally.

Commercial Services

Commercial services could provide valuable visitor services at the park, such as gift stores,

lodging, and food service. These services would add to visitor enjoyment of the park.

Strategies

Park managers will use the following commercial services strategies:

- Manage businesses serving the park through proper instruments subject to the final preferred alternative and any proposed legislation required to implement the final South Unit GMP/EIS. Such instruments might be similar to concession contract and commercial use authorizations used in the NPS.
- Ensure that all commercial activities in the park provide high-quality visitor experiences while protecting important natural, cultural, and scenic resources.
- Before concession contracts and commercial use authorizations are renewed or advertised, ensure that the types of authorized use are necessary and/or appropriate, levels of use are consistent with resource protection and high-quality visitor experiences, and the commercial services program can be managed efficiently and effectively. Prepare a commercial services plan that describes in detail the actions required to achieve goals for commercial services and related visitor experiences.

RELATIONSHIP OF THE GENERAL MANAGEMENT PLAN TO OTHER PLANNING EFFORTS

Several plans for areas in or near the South Unit could influence or be influenced by actions presented in this GMP/EIS and must be considered. These relevant plans and studies are listed below.

NATIONAL PARK SERVICE MANAGEMENT PLANS AND STUDIES

North Unit General Management Plan

The *2006 North Unit General Management Plan* was developed to provide general future guidance and direction for the management of the North Unit of Badlands National Park for the next 15 to 20 years. The plan provides a framework for making decisions about ways to ensure the preservation of natural and cultural resources and provide for a high-quality visitor experience in the North Unit of the park. The completed plan establishes a basis for decision making in accordance with defined long-term goals. The North Unit GMP provides broad direction for resource management and visitor experiences and in most cases does not propose specific actions.

Prairie Dog Management Plan

A *Black-tailed Prairie Dog Management Plan* was completed for the North Unit in 2007. The principal objectives of the management plan are to ensure that the black-tailed prairie dog is maintained in its role as a keystone species in the mixed-grass prairie ecosystem on the North Unit, while providing strategies to effectively manage instances of prairie dog encroachment onto adjacent private lands (NPS 2007b). Plague was detected in the North Unit black-tailed prairie dog population for the first time in 2009. Deltamethrin dusting efforts have been ongoing in the North Unit to protect existing populations of black-tailed prairie dogs, as well as black-footed ferrets (NPS 2009b).

Air Tour Management Plan

Officially established in 2000, the NPS Natural Sounds Program provides park managers with technical assistance and national policy development and guidance for a consistent approach to managing acoustic environments. In 2006, the Natural Sounds Program assisted 39 parks with data collection and analysis, monitoring, and planning. Developing soundscape goals, objectives, and standards and identifying appropriate measures for mitigating noise impacts are part of the planning process. Badlands National Park is one of five parks currently developing an air tour management plan.

Fire Management Plan

The *Badlands National Park Fire Management Plan* was established in 2004. This plan is a detailed program of action, providing specific guidance and procedures for accomplishing park fire management objectives. The plan defines levels of protection necessary to ensure the safety and protection of facilities and resources; minimizes undesirable environmental impacts of fire management; and defines levels of fire use to restore and perpetuate natural processes given current understanding of the complex relationships in natural ecosystems.

The South Unit is included in the “Boundary Unit” of the *Badlands National Park Fire Management Plan*.

OTHER FEDERAL, TRIBAL, AND STATE AGENCY MANAGEMENT PLANS AND STUDIES

Buffalo Gap National Grassland (Nebraska National Forest and Grasslands) Land and Resource Management Plan

The Badlands National Park is surrounded by the Buffalo Gap National Grassland. The Buffalo Gap National Grassland is administered by the U.S. Forest Service and encompasses nearly 600,000 acres located in scattered tracts in southwestern South Dakota. In 2009, the Nebraska National Forest and Grasslands updated the 2005 Land and Resource Management Plan to reflect changes in acreage and priorities. This Land and Resource Management Plan offers guidance for all resource management activities in the Nebraska National Forest. It suggests management standards and guidelines and describes resource management practices, levels of resource production, user capacities, and the availability and suitability of lands for resource management (www.usda.fs.gov).

Proposed Tony Dean Cheyenne River Valley Conservation Act of 2010

On May 5, 2010, U.S. Senator Tim Johnson (D-SD) introduced the *Tony Dean Cheyenne River Valley Conservation Act* of 2010 to include a portion of the Buffalo Gap National Grassland in the National Wilderness Preservation System. This act has not yet been enacted as a law and still requires Congressional and Presidential approval. The proposed bill is based on an earlier recommendation by the U.S. Forest Service for wilderness protection in the areas of Indian Creek and Red Shirt. The proposed bill includes approximately 48,000 acres within the National Grassland, covering land in the Indian Creek, Red Shirt, and Chalk Hills areas. The act would leave the 6-mile-long Indian Creek Road open to vehicles by excluding it from the wilderness boundaries. Hunting would continue, as would recreational rock collecting. Johnson named this legislation after the late Tony Dean, a longtime South

Dakotan and advocate for hunting and protecting South Dakota's open spaces (proposed Senate Bill 3310).

Nebraska National Forest Travel Management Plan

A Record of Decision was signed in April 2010 on the *Nebraska National Forest Travel Management Plan Final Environmental Impact Statement*. The purpose of this action is to improve management of motorized vehicle use on National Forest System lands within the Nebraska National Forest in accordance with regulations at 36 CFR 212, 251, 261, and 295, and as described in "Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule" (70 *Federal Register* (FR) 216, the 2005 Travel Management Rule). The Record of Decision documents the decision authorized under the U.S. Forest Service 2005 Travel Management Rule. The decision implements a motorized vehicle system for the Nebraska National Forest units on the Pine Ridge and Bessey Ranger Districts, the Samuel R. McKelvie National Forest, the Oglala National Grassland, and the Fall River Ranger District portion of the Buffalo Gap National Grassland. The plan decreases the miles of motorized roads, increases the miles of motorized trails, and reduces the number of cross-country use areas in order to provide users a variety of experiences. This decision will require an amendment to the Forest Plan to implement the proposed action.

ONGOING PROJECTS PLANNED FOR THE NEAR FUTURE

Projects that are ongoing or that are funded and likely to be initiated (or even completed) before this GMP/EIS is complete are listed below. These projects *are not* part of actions proposed in this GMP/EIS and will be (or have been) covered under separate environmental compliance documents. These projects *are* considered in the cumulative effects sections of this document along with the other planning efforts described in the previous section.

Bombing Range

The cleanup of the former Bombing Range located on the Pine Ridge Indian Reservation is an ongoing effort by the USACE and the OST to identify and mitigate public safety concerns relating to the former military use of these lands. The Bombing Range was divided into 28 sectors to facilitate the characterization of ordnance and explosives concentrations, identify safety problems, and study risk management alternatives. A vast majority of the South Unit is located within the Bombing Range. The areas cleared to date include pieces on top of Cuny Table (Engelbart, pers. comm., 2010). Given the current technology, it is unlikely that unexploded ordnance would be cleared within the timeframe of this plan, but some of the more used and passable roads within the South Unit should be cleared in the next few years pending available funding and right of entry from the OST (Engelbart, pers. comm., 2010). The USACE recommended that institutional controls be implemented for the entire former Bombing Range. Institutional controls include elements that inform the public of the site's former use and the potential for unexploded ordnance. Primary populations affected by the former Bombing Range include members of the OST who work in, live on, and use the land for ranching or recreation and visitors to the Pine Ridge Indian Reservation and Badlands National Park.

South Dakota National Guard Training Sites (2010–2015) Environmental Assessment

An environmental assessment is being prepared for a special use management permit authorizing the South Dakota Army National Guard to use portions of the Buffalo Gap National Grassland as a training site (USFS *in prep.*).

Proposed Crazy Horse Scenic Byway

The OSPRA is pursuing Federal Highway Administration approval for the proposed 215-mile Crazy Horse Scenic Byway. As described in an article by Tom Katus in the Lakota Country Times on October 13, 2009,

The 215-mile Crazy Horse Scenic Byway will begin at the eastern gates of Interstate 90 at Kadoka (Exit 150) and Cactus Flats (Exit 131) and will continue through the Badlands, Pine Ridge Indian Reservation and Black Hills, terminating at Crazy Horse Memorial Mountain. The Byway will become the most culturally and naturally relevant interpretive byway in South Dakota and will: link the Badlands Loop State Scenic Byway, the North and South Units of the Badlands National Park through the Pine Ridge Indian Reservation, Wind Cave National Park, the Wildlife Loop in Custer State Park, the Peter Norbeck National Scenic Byway, Mt. Rushmore National Memorial and the Crazy Horse Memorial Mountain; double the visitors to the Badlands National Park from approximately 1 million to 2 million annually, within a decade; and encourage positive race relations between the descendants of the 1800s Oglala Lakota and the American settlers, predominantly white but also including African-, Asian- and Hispanic-Americans.

Mni Wiconi Water Project

The Mni Wiconi water project is a regional water distribution system being built to transport potable water from the Missouri River to the Pine Ridge Indian Reservation. The pipeline is being built along BIA Highway 41 (BIA 41) along the western edge of the park. The construction is primarily within the road prism of existing roads, thus reducing the adverse impacts of the project. The project, which has a statutory completion date of 2013, is expected to be approximately 88 percent complete by the end of fiscal year (FY) 2010. When complete, it will distribute water across 12,500 square miles and will provide a clean, safe, adequate supply of drinking water from the Missouri River to than 52,000 beneficiaries on three American Indian reservations and within a large non-reservation rural water system embracing nine counties. Project sponsors are the OST, the

Rosebud Sioux Tribe, the Lower Brule Sioux Tribe, and West River/Lyman-Jones. The clean water supply will help prevent the many water-related health problems the beneficiaries currently suffer and will spur economic development in the region (U.S. House of Representatives FY 2011 Energy and Water Funding).

Dakota, Minnesota, and Eastern Railroad Line

For 15 years the Dakota, Minnesota, and Eastern Railroad Corporation (DM&E) has pushed a proposal to extend its railroad 278 miles to access surface coal mines in Wyoming's Powder River Basin. The line would be near the South Unit, near Red Shirt Table, and about 6 miles from the wilderness boundary in the North Unit. DM&E received regulatory approval from the U.S. Surface Transportation Board on January 30, 2002, to proceed with the \$1.5 billion project. Although the route has been approved, construction has been delayed by court challenges. If the rail line is built, emissions of soot from the diesel locomotives might cause perceptible deterioration of visibility in the park. Currently, the project is on hold. DM&E spokesman Mike Lovecchio stated that the decision to proceed with expansion will be contingent upon several conditions, such as access to a right-of-way land corridor, mine and utility contracts, and the economic and regulatory environment (Casper Star-Tribune 2009).

Solid Waste Management Facility

The OST operates a solid waste management facility at Red Shirt, near the south boundary of

the South Unit, near BIA 41 and BIA Route 2. The 50-acre landfill facility accepts baled solid waste from the baler at Pine Ridge and from transfer stations located at various communities on the reservation. The landfill, which is lined in accordance with U.S. Environmental Protection Agency (EPA) regulations, uses a leachate collection system. Water quality is monitored through a series of monitoring wells.

Commercial Wind Power Development

On May 27, 2010, the OST Council voted to accept the charter of the OST Renewable Energy Development Authority. This new Authority oversees community and commercial-scale renewable energy development on the Pine Ridge Indian Reservation. The Authority's initial focus is the development of commercial-scale wind power, and it has already identified a number of large sites with outstanding Class 5 winds, including sites adjacent to the South Unit.

Paving BIA Route 2 South of South Unit

The OST, through direct funding from the Federal Lands Highway Program, Federal Highway Administration, has proposed to pave 18.5 miles of BIA Route 2 from the junction with BIA Route 27 at the White River Visitor Center west to a point along BIA Route 2. Because of direct funding to the Tribe, the BIA has no involvement in the project. The OST Transportation Department has indicated the project is in the planning phase and public scoping began in June 2010.

CHAPTER 2: Park Management Options

CHAPTER 2



INTRODUCTION

The Oglala Sioux Tribe (OST) and National Park Service (NPS) are embarking upon an historic effort, which may result in establishing the country's first Tribal National Park. The past decade has been dedicated to government-to-government consultation to address the OST's interest in regaining management authority over the Tribal trust lands that now constitute the South Unit of Badlands National Park (South Unit).

The transition from Badlands National Monument to Badlands National Park in southwestern South Dakota in 1968 included the lands within the monument (North Unit) and what is now known as the South Unit. The lands that comprise the South Unit, located within the boundaries of the Pine Ridge Indian Reservation, were taken through condemnation to create the Bombing Range.

The Bombing Range, consisting of 341,725 acres, was created in 1942 and displaced 890 families in the Pine Ridge Indian Reservation. The area contained public lands, privately owned lands, Tribal lands, and Indian allotted lands.

The War Department notified the OST on July 17, 1942, that it would take possession by August 1, 1942, and bombing would start at this time. By August 27, 1942, 47 families had been removed and another 60 families remained within the Bombing Range. The original deadline was extended to October 1, 1942, to accommodate the hardship of moving the additional 60 families.

The purpose of the Bombing Range was to train servicemen for World War II. It continued to be used for training purposes until it was declared excess property in 1968. At that time Congress conveyed the excess Bombing Range lands to the OST with the stipulation that two largely undeveloped, remote tracts of lands totaling 140,000 acres (the South Unit) be held in trust and administered by the NPS as part of the legislation to redesignate Badlands National Monument to Badlands National Park (Public Law (P.L.) 90-468).

In 1975, the OST signed an easement for management of Tribal land (133,300 acres) to the NPS (Trust Deed, January 2, 1976; Easement Deed, January 2, 1976). In 1976, the Secretary of the Interior and the OST signed a Memorandum of Agreement detailing the terms of management for the conveyed lands (the South Unit) as an extension of Badlands National Park. The agreement remains, but has not proven to be an effective management framework acceptable to either the OST or the NPS.

The NPS began developing a general management plan (GMP) for the entire Badlands National Park in 2000. When discussions broke down addressing the South Unit, NPS proceeded with a GMP / Environmental Impact Statement (EIS) for the North Unit. Discussions addressing the South Unit began in 2003. Between 2006 and 2010, a planning team consisting of members of the OST and employees of the NPS has held numerous workshops to discuss the current situation and brainstorm ways for the OST to ultimately find a way to manage the South Unit. The planning team has been open and transparent in its discussions. Meetings have been held with the Oglala Sioux Parks and Recreation Authority (OSPRA), the OST Lands and Natural Resources Committee, Tribal Council and President, and NPS leadership. Three formal meetings have been held between OST representatives (including the Tribal president) and the NPS Midwest Regional Office (including the Regional Director), several briefings and meetings have been held with the NPS directorate, and one meeting was held with the Retirees Coalition. Those involved have found innumerable opportunities to discuss the management plan with friends, family, neighbors, and co-workers.

Public Law 90-468, Section 6, states that the OST may convey to the Secretary of the Interior up to 40 acres of tribally owned lands on the reservation for a facility to interpret the natural phenomena of the South Unit and the history of the Sioux Nation. This land does not necessarily

have to be within the boundaries of the South Unit.

This chapter includes a discussion of the cultural significance of the connection of the OST to the South Unit and the preferred management option for a new Tribal National Park, as well as the

other management options that had been under consideration. The remainder of the South Unit GMP/EIS describes the resource and visitor experience alternatives, their impacts, and the preferred alternative for the management of the new Tribal National Park.

CULTURAL SIGNIFICANCE OF THE SOUTH UNIT TO THE OGLALA SIOUX TRIBE

The OST's connection to their homelands can be traced through oral records, which say that the Lakota people originated in the Black Hills and scattered throughout different regions in North America. By the 1660s they started to move into the Great Lakes region and by the 1700s continued into the Northern Plains and the eastern slopes of the Rockies. By the time of European contact, their home territory stretched from the western Dakotas to eastern Montana and Wyoming, with the Black Hills at the center of their territory (OST 2001). They roamed freely across this entire landscape, following the buffalo and migrating with the seasons. The Lakota people spent their lives hunting and gathering on the prairie and developed a unique and sophisticated culture based on the principle of living in harmony with nature and the environment.

Lakota Itacan (leader) Red Cloud was instrumental in negotiating the Fort Laramie Treaty of 1868, which created the expansive Great Sioux Reservation (see the map showing Fort Laramie Treaty Territories of 1868). The Black Hills, or Paha Sapa, are located in the center of this vast territory. This treaty established the legal boundaries of land "set apart for the absolute and undisturbed use and occupation" of the Lakota people (15 Stat. 635). While this treaty was entered into in good faith by the Lakota, gold was soon found in the Black Hills inside the reservation. The United States allowed miners to trespass on Lakota land. With each new treaty, the indigenous peoples lost more and more land until finally in 1889 the Great Sioux Reservation was reduced to five separate reservations, including the Pine Ridge Indian Reservation (approximately 2.7 million acres of prairie and badlands).

By signing treaties with the Lakota, the United States recognized the Tribe as a sovereign government with the right to self-determination. The *Indian Reorganization Act* of 1934 allowed all tribes to adopt constitutions and develop Tribal Councils. It is important to understand that the

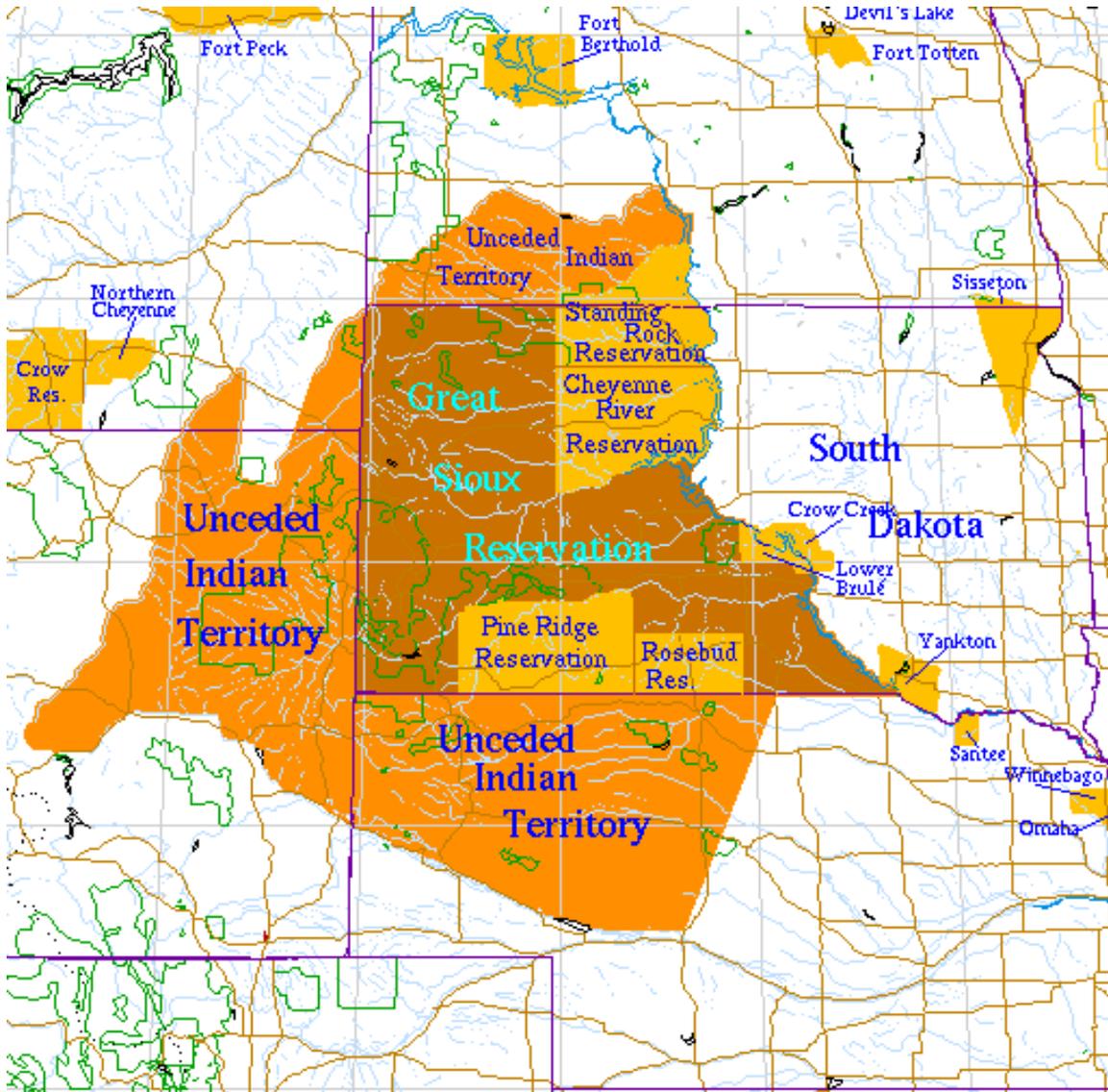
OST is a construct of the U.S. government. The OST is part of the Greater Sioux Nation, also called the Lakota/Dakota/Nakota Nation. The Lakota Nation includes the Oglala, Brule, Hunkpapa, Blackfoot, Minneconjou, No Bows, and Two Kettle. The Lakota speak the "L" dialect of the Siouan language. The Oglala are part of the Tetonwan division, "dwellers on the plains," occupying the western regions of Sioux territory.

In 1887, Congress passed the *Dawes Act*, also known as the *General Allotment Act*, which subdivided the reservations into 160-acre lots and distributed them to Tribal members. The remaining Tribal lands were purchased by the U.S. government at a minimum price and opened up to white settlement.

The *General Allotment Act* began an era of attempted assimilation of Indian Tribes across the United States. The law was designed not only to break up large Indian land holdings and increase Anglo settlement, but to dismantle Indian culture and traditions. The government's policy of assimilation had a tremendous adverse impact on all tribes. Children were sent to government boarding schools and completely stripped of their culture. Federal law prohibited American Indians from practicing their religion or speaking their native language. Entire generations lost knowledge of their cultural and spiritual ways.

In Pine Ridge the first allotments were made in 1904 and the first allotment schedule was approved in 1906. In all, 8,274 allotments were made to Indians on the Pine Ridge Indian Reservation, comprising over 2 million acres, which includes land in the South Unit.

On behalf of Itacan Red Cloud, Big Road and Kicking Bear were sent to ask Itacan Big Foot to come to the Red Cloud Agency and negotiate a truce with the Seventh Cavalry of the U.S. Army. En route, Big Foot's band of Hunkpapa and Minneconjou Sioux, which included elderly, women, and children, was disarmed and slaughtered by the Seventh Cavalry in the 1890 Wounded Knee Massacre.



FORT LARAMIE TREATY TERRITORIES OF 1868

Sources: Crystal Links 2003; OST 2001; National Wildlife Federation 2001

PREFERRED MANAGEMENT OPTION AND OTHER CONSIDERED MANAGEMENT OPTIONS

In response to a need to increase the involvement of Tribe members in decision making for the South Unit, the NPS and the OST, within this planning process, developed concepts for structuring the management of the South Unit. Between March and May 2007, the planning team discussed a range of seven options for managing the South Unit. The seven options included four options that have been carried throughout the process (no action, shared management, NPS-affiliated area, and deauthorization) and one option that became the preferred management option, Tribal National Park. Two of the seven options discussed were brought to the table by members of the Tribe's Oyate group. In reviewing these options, the team agreed that three of the options would fit within the four described above.

In the spring of 2008, Newsletter #1—describing the planning process and the management options—was published and widely distributed, followed by 15 public open houses. By July 2008, after analyzing the hundreds of public comments, the team added to, deleted, and refined the options, leaving six management options for further consideration by the planning team, the OST, and the NPS. As of January 2009, the management options had been reduced to five: no action, shared management, a Tribal National Park affiliated with the NPS, deauthorization, and a Tribal National Park not affiliated with the NPS. Further refinements between August 2009 and January 2010 resulted in the seven management options discussed in this document and the selection of the management option that the NPS and the OST will move forward in a joint legislative proposal.

In discussing how these management options would be treated in the South Unit GMP/EIS, the planning team concluded that the decision on the management option should be determined through consultation between the NPS and the OST government. It became clear from discussions with Tribal officials and members and from public comments on the first

newsletter that the final disposition of the South Unit would not be a simple decision. Sentiments ranged from turning the management of the land back to the OST to continuing current management.

The proposed preferred management option is supported by the planning team, the Badlands Superintendent, the Midwest Regional Director, the NPS Director, OSPRA, and the OST Tribal Council and President. Because any change to the status of the South Unit requires Congressional input, this preferred management option will be presented to Congress for action, along with a legislative environmental impact statement, prepared pursuant to 40 CFR 1506.8 (the regulations of the President's Council on Environmental Quality), containing an analysis of the impacts to the human environment associated with the management options discussed here.

OPTION 1: CONTINUE CURRENT MANAGEMENT

Option 1, Continue Current Management, assumes that the NPS would continue to manage the South Unit as at present. The NPS would continue to be responsible for the overall administration of the South Unit and the day-to-day on-site activities, providing two full-time positions. Existing operations and visitor facilities would remain in place, concentrated at White River, and the White River Visitor Center would continue to be the principal visitor contact area in the South Unit until the LHEC is built. The NPS and OST would share responsibility for operation of the White River Visitor Center, with the NPS primarily responsible for maintaining the visitor center and providing training and development of interpretive volunteers and staff. The OSPRA would be responsible for staffing the White River Visitor Center. Jointly, the NPS and OSPRA would continue to develop exhibits and provided visitor programming in the summer months.

Under the 1976 Memorandum of Agreement currently in effect, 50 percent of the entrance fees collected at the park entrance gates in the North Unit would continue to be collected on behalf of the OST and directed to OSPRA for expenditures in the South Unit. NPS employees would continue to report to the superintendent of Badlands National Park. Tribal employees who staff the White River Visitor Center would continue to be Tribal employees responsible to the Executive Director of OSPRA.

Resources would continue to be managed by the OST to perpetuate and protect the natural environment and preserve cultural resources, following the federal laws, regulations, and policies that govern units of the national park system. Hunting would still be permitted for Tribal members only, as regulated by the OST. The NPS would be responsible for implementation of the South Unit GMP/EIS.

OPTION 2: THE PREFERRED MANAGEMENT OPTION: TRIBAL NATIONAL PARK

In this alternative, Congress would designate the South Unit as a Tribal National Park, managed and administered by the OST and closely associated with the national park system. The Tribal National Park would be managed in a manner consistent with the Tribal laws and resolutions of the OST and guided by all laws and policies generally applicable to units of the national park system. This option would ensure that the Oglala Lakota people manage, own, and operate their lands for the educational and recreational benefit of the general public, including both Tribal and nontribal visitors and residents. Once construction of the LHEC is complete, it would be the primary visitor contact area for the park and an important component of the visitor experience. Until the LHEC is operating, the White River Visitor Center would be the primary visitor contact area for the park. The OST would be responsible for training and development of staff and volunteers with technical assistance from the NPS, if requested.

A new agreement would be established between the OST and the NPS to clarify the administrative and procedural details necessary

for the full transition of park management from direct NPS oversight to the OST. Upon execution of the new agreement, the 1976 Memorandum of Agreement would be replaced. The agreement would contain a Tribal park staffing plan, organizational plan, and business plan prepared by the OST with the assistance of the NPS. When completed, the agreement would be submitted to the OSPRA board, the OST Council and President, and the Regional Director of the Midwest Region for concurrence, before routing to the Director for approval by the Secretary of the Interior.

The Tribal National Park would be identified by signs featuring the OST logo and the NPS arrowhead. The park would be funded by federal appropriations and entrance fees. The Tribal National Park would receive an annual funding appropriation from Congress to manage and operate the park and would also be allowed to compete for monies and technical assistance within the established NPS allocation process. Technical assistance could include interpretation, resource protection, and development of the LHEC. Additionally, the Tribal National Park would be authorized to implement an entrance fee with the provision that those funds would be used for park operations.

The NPS, generally, has the responsibility to work closely with the management entity to prepare a GMP for areas closely associated with the NPS. In this case, the final GMP/EIS being developed in this planning process would be adopted by the OST, thus fulfilling the NPS responsibility to prepare a long-term plan for the area in consultation with the site's managers.

At the start of the transition, experienced NPS employees would staff administrative and resource positions, mentoring Tribal employees in managerial and other skills through on-the-job and in-service training and other professional developmental programs. As the Tribal

employees develop the necessary skills, they would step into the positions previously held by NPS employees and assume responsibilities for park operation. Tribal park employees would receive on-the-job training; would have access to NPS servicewide training as well as relevant training opportunities outside the NPS; and would have opportunities to take relevant training and coursework outside the NPS at local or regional institutions of higher education, funded by NPS. Ultimately, staff of the Tribal National Park would be OST employees. As soon as practicable, the park would be wholly under Tribal management.

Resources would be managed to perpetuate and protect the natural environment and to preserve cultural and historic resources and values, following the ordinances and regulations established by the OST and the policies pertaining to units of the national park system. Hunting would be permitted for Tribal members only as regulated by the OST. The OST would be responsible for implementation of the South Unit GMP/EIS.

The preferred management option would require Congressional action to reestablish the South Unit as the first National Tribal Park, managed by the OST and closely associated with the national park system.

OPTION 3: SHARED MANAGEMENT

Under option 3, the NPS and the OST would share responsibility for the day-to-day on-site management of the South Unit within Badlands National Park. Associated visitor activities would be managed jointly under terms and conditions of a new agreement. The Tribe would assume more direct control over the operation and management of the South Unit than currently. Existing operations and visitor facilities would remain concentrated at White River, and the White River Visitor Center would continue to be the principal visitor contact area in the South Unit until the LHEC is built. The NPS and the OST would share responsibility for managing the visitor center and for training and development of staff and volunteers. In order to facilitate a strong partnership, the NPS would provide training and funding to the OST to

assume tasks and positions necessary for shared management of the South Unit. NPS employees would work side-by-side with OST employees.

A new agreement would be negotiated and the 1976 Memorandum of Agreement would be replaced. The new agreement would determine how expenses in the South Unit would be funded. In order to bring greater attention to the resources and opportunities at the South Unit, additional park signs would be placed along the major roads (I-90; US 385; SD 73, 44, and 79; and BIA Route 2) to direct visitors into the South Unit. NPS employees would report to the superintendent of Badlands National Park. Tribal employees staffing the White River Visitor Center would be Tribal employees responsible to the manager of the South Unit. The Superintendent of Badlands National Park and the South Unit manager would both report to the NPS.

Resources would be managed to perpetuate and protect the natural environment and preserve cultural resources, following the laws governing activities of the NPS and ordinances and regulations established by the OST. Hunting would still be permitted for Tribal members only, as regulated by the OST. The NPS and the OST would be responsible for implementation of the South Unit GMP/EIS.

OPTION 4: AFFILIATED AREA

To show the track of the administrative history, option 4 has been included, even though it is similar to the preferred option. In option 4, the South Unit would be managed solely by the OST as an affiliated area of the national park system. The OST would be responsible for the administration and the day-to-day on-site operations. Existing operations and visitor facilities would remain in place, concentrated at White River, and the White River Visitor Center would continue to be the principal visitor contact area in the South Unit. Until the LHEC is built, the OST would be responsible for operation of the visitor facilities and services. The NPS would provide technical expertise and policy guidance as requested. Interpretive activities and visitor education would be directed by the OST, with technical assistance from the NPS, as

requested. Technical assistance could include design and content of brochures, exhibits, and interpretive programs.

Affiliated areas are neither federally owned nor directly administered by the NPS, but are recognized as closely related to the collection of nationally significant resources managed by the NPS and administered by a qualified organization in a manner consistent with all laws and policies generally applicable to units of the national park system. Affiliated areas are identified by signs featuring the NPS arrowhead. Affiliated areas have the opportunity to request technical assistance and/or funding for specific projects; however, assistance is typically not guaranteed.

At the reestablishment of the South Unit as an affiliated area—separate from Badlands National Park—the 1976 Memorandum of Agreement would be replaced, resulting in loss of entrance fee revenue. The OST, as the managing entity, would be required to find and develop its own funding sources for operation of the South Unit Affiliated Area, and could choose to implement an entrance fee for access and use of the Affiliated Area. Staff of the affiliated area would be employed by the OST. The OST, working in conjunction with other state and federal agencies, could place signs along the major roads (I-90; US 385; SD 73, 44, and 79; and BIA Route 2) to direct visitors into the Affiliated Area.

Resources would be managed to perpetuate and protect the natural environment and preserve cultural resources, following the ordinances and regulations established by the OST and the laws and policies pertaining to units of the national park system. Hunting would be permitted, as regulated by the OST. The OST would be responsible for implementation of the South Unit GMP/EIS.

Option 4 would require Congressional action to reestablish the South Unit as an affiliated area of the national park system.

OPTION 5: NEW NATIONAL PARK

To show the track of the administrative history, option 5 has been included even though it is similar to the preferred option.

Under option 5, Congress would reestablish the South Unit as a distinct national park, a distinct new unit of the national park system, managed by the OST under the administration of the NPS. The unit would be managed in a way consistent with the laws and policies of the NPS and guided by the Tribal laws and resolutions of the OST. The OST would be responsible for the administration and the day-to-day on-site operations. The OST would be responsible for operation of the visitor facilities and services. The LHEC would be the primary visitor contact area for the park and an important component of visitor experience. The OST would be responsible for training and development of staff and volunteers. Technical assistance from the NPS would be available if requested, as funding permits.

A new agreement would be established between the OST and the NPS to clarify administrative and procedural details necessary for the management of the distinct national park as a unit of the national park system. The agreement would also contain a park staffing plan, organizational plan, and business plan that would be prepared by the OST in close coordination with the NPS. When completed, the agreement would be submitted to both the OST Tribal Council and the Regional Director of the Midwest Region for concurrence before routing to the NPS Director for approval.

The national park would be identified by signs featuring the OST symbol and the NPS arrowhead. There would be signs along the major roads (I-90; US 385; SD 73, 44, and 79; and BIA Route 2) to direct visitors into the Tribal Park. The national park would no longer receive a percentage of the entrance fee gate receipts collected in the North Unit of Badlands National Park, but would have a separate

entrance fee for the national park. This revenue, along with a separate annual funding appropriation from Congress, would be used to manage and operate the national park. In addition, the national park could compete for funds and technical assistance within the established NPS fund and technical assistance allocation process.

The site superintendent/manager, who would report to the Midwest Regional Director, would be selected by the OST and would be responsible for both the administration and the day-to-day on-site activities at the national park. The Tribal national park manager would be responsible for management of the park consistent with the terms and conditions of the agreement.

Resources would be managed to perpetuate and protect the natural environment and preserve cultural resources, following the ordinances and regulations established by the OST and the policies pertaining to units of the national park system. Hunting would be permitted for Tribal members only, as regulated by the OST. The OST and the NPS would be responsible for implementation of the South Unit GMP/EIS.

Option 5 would require Congressional action to reestablish the South Unit as a distinct Tribal National Park managed by the OST under the administration of the NPS.

OPTION 6: DEAUTHORIZATION

In option 6, the South Unit would be deauthorized by Congress, and the management of the land returned to the OST. The former site would be managed in whatever manner the OST selected, and the OST would be responsible for all costs associated with the management and operation of the former South Unit. The 1976 Memorandum of Agreement would be replaced and funding assistance from the NPS would cease. Funding would be the responsibility of the OST. The South Unit would no longer be a

component of the national park system. The effect on the LHEC project is unclear.

Option 6 would require Congressional action to deauthorize the South Unit.

OPTION 7: OGLALA SIOUX TRIBAL PARK

Option 7 provides for the eventual deauthorization of the South Unit and return of its management to the OST as a Tribal Park. In this option, the NPS would provide increased training and education of OST members over an established period of time, with the ultimate goal of having the OST manage the unit as a Tribal Park. In order to provide for the training and development of future Tribal Park employees, the OST and/or the NPS could establish programs with local and regional colleges, as well as local high schools, to allow OST members to be educated and trained in all aspects of resource management. This option would also allow OST members access to NPS training programs.

The implementation of this option would begin with the execution of an agreement, reviewable on an annual basis, between the NPS and the OST that establishes clear decisions and achievable benchmarks for each party in terms of training and educational opportunities and practical experience in park management. As benchmarks are achieved, additional management responsibility would shift to the Tribe as site manager. Opportunities for funding would come from the OST and the NPS working in concert. The agreement document would provide for preferential hiring of enrolled Tribal members. The effect on the LHEC project is unclear.

Option 7 would require Congressional action to deauthorize the South Unit as a part of Badlands National Park.

CHAPTER 3: Alternatives, Including the Preferred Alternative

CHAPTER 3



INTRODUCTION

This *South Unit General Management Plan / Environmental Impact Statement* (South Unit GMP/EIS) presents four alternatives that describe how natural and cultural resources and visitor uses will be managed at the South Unit of Badlands National Park (South Unit). The alternatives consist of alternative A, the No-Action Alternative (continue current management); alternative B (expand interpretive opportunities); alternative C (focus on resource protection/preservation); and alternative D, the preferred alternative (protect resources while expanding interpretive experience).

The alternatives, based on the park's mission, purpose, and significance, present different ways to manage resources and visitor use and improve the park's facilities and infrastructure. The No-Action Alternative is included as a baseline for comparing the environmental consequences that could result from implementing each action alternative.

As detailed in "Chapter 2: Park Management Options," the planning team also developed management options for the South Unit. The

management options documented as a part of the South Unit GMP/EIS will require government-to-government negotiation for management control over the lands. The outcome of such negotiations will form the basis for determining which management option will ultimately work for the greater good for both entities while keeping in mind the goals and objectives embodied in the resource and visitor experience alternatives. Both parties agree that the resource and visitor experience alternatives are reasonable and that whoever is ultimately responsible for managing the South Unit will be responsible for seeing that the direction specified in the final South Unit GMP/EIS is carried out accordingly.

Tables that summarize the key differences between the alternatives and the impacts that could be expected from implementing each alternative are presented at the end of this chapter. The "Comparison of Environmental Consequences" table (at the end of this chapter) is based on the analyses in "Chapter 5: Environmental Consequences."

IMPLEMENTATION OF THE GENERAL MANAGEMENT PLAN

Although the South Unit GMP/EIS provides the analysis and justification for future South Unit funding proposals, this GMP/EIS does not guarantee future National Park Service (NPS) funding. Many actions would be necessary to achieve the desired conditions for natural resources, cultural resources, visitor experience, and facilities as envisioned in this plan. The NPS or the Oglala Sioux Tribe (OST) will request funding to achieve these desired conditions; although both entities hope to secure this funding and will prepare accordingly, the South Unit may not receive enough funding to achieve all desired conditions.

The implementation of the approved plan, no matter which alternative, will depend on future NPS funding levels and servicewide priorities, and on partnership funds, time, and effort. The approval of a GMP does not guarantee that funding and staffing needed to implement the plan will be forthcoming. Full implementation of the plan could be many years in the future.

The implementation of the approved plan also could be affected by other factors. Once the South Unit GMP/EIS has been approved, additional feasibility studies and more detailed planning and appropriate environmental documentation may be required before any proposed actions can be carried out. Additional planning and/or revisions may be needed,

depending on which alternative is implemented and what funding levels are achieved. These more detailed plans would tier off of this South Unit GMP/EIS, describing specific actions managers intend to take to achieve desired conditions and long-term goals. Some of these implementation plans are prepared for parks in response to NPS policies.

When the Record of Decision is signed, and if the preferred management option and alternative remain similar to what is outlined in this document, implementation would not be possible without legislation and funding. Any change in management entity would take place only after action by Congress. The status quo would remain in effect until both the legislation and funding are in place. In the interim, the NPS and the Tribe agree to prepare for and implement the parts of this plan that are possible and appropriate.

This GMP/EIS calls for a commitment to the NPS *Organic Act* which would include an overall general adherence to NPS policies, regulations, guidelines, and laws and Tribal law, policies and resolutions. The combination of these could alter the management actions and practices of the South Unit in ways unforeseen at this time.

MANAGEMENT ZONES

Management zones prescribe how different areas of the South Unit would be managed and are thus focused on the future or desired conditions. Each management zone specifies complementary natural resource conditions, cultural resources conditions, opportunities for visitor experiences, and appropriate facilities, and combines these into a possible management strategy that could be applied to locations within the South Unit. As such, management zones describe the management priorities or long-term goals for various areas.

Regardless of the title of the management zone, the NPS and the OST intend to preserve and protect natural and cultural resources to the greatest extent possible. An overview of the management zones is provided in table 1. The action alternatives presented later in this chapter each propose a different concept for managing the South Unit; therefore, the management zones were placed in different locations or configurations on the map according to the overall focus of each alternative.

TABLE 1. MANAGEMENT ZONES FOR THE SOUTH UNIT

Management Zone	Desired Resource Condition	Desired Visitor Experience and Visitor Uses	Kind and Level of Management Activities	Kind and Level of Development
Natural Area / Recreation	Preservation of native species and natural processes; cultural and paleontological resources actively, monitored and protected; moderate tolerance for resource impacts to accommodate visitor safety.	Emphasis on experiencing an encounter with natural setting, intimate and away from vehicles; pristine night skies, good visibility, and unobstructed views prevalent; moderate tolerance for resource modifications and degradation related to visitor use or facility development; opportunities for visitors to interact personally with natural surroundings on unpaved designated trails, where developed; moderate probability of encountering other visitors; limited on-site interpretation and interaction with park staff; access by hiking or pack stock use; pack stock not allowed on designated hiking trails; camping allowed; possible limits on visitation and length of stay to protect resources and maintain desired visitor experiences; appropriate commercial services (e.g., guiding) could be permitted.	<p>Management actions focused on preventing resource impacts and providing for visitor safety.</p> 	Development limited to unpaved trails, picnic sites, wildlife handling facilities, and research sites.

Management Zone	Desired Resource Condition	Desired Visitor Experience and Visitor Uses	Kind and Level of Management Activities	Kind and Level of Development
<p>Preservation</p>	<p>Natural resources are preserved or restored so as to showcase a full complement of native species and natural processes; natural sounds, night sky, air quality, visibility, and unobstructed views are protected and maintained in excellent condition; cultural resources are preserved and protected; very low tolerance for resource modifications and degradation related to visitor use.</p>	<p>Visitor experience is self-directed; no designated trails; high level of solitude, self-reliance; minimal interaction with park staff or other visitors; many opportunities for independence, closeness to nature, challenge, and adventure. No designated trails; access could be limited to hiking or pack stock; camping possibly allowed; possible limits on visitation and length of stay to protect resources and maintain desired visitor experiences. Appropriate visitor services could be permitted.</p>	<p>—Minimum tool” principle used in research and management activities; evidence of management activities minimal and subtle.</p> 	<p>Trails and other facilities not developed or maintained.</p>

Management Zone	Desired Resource Condition	Desired Visitor Experience and Visitor Uses	Kind and Level of Management Activities	Kind and Level of Development
Research	Maximum preservation of irreplaceable, particularly sensitive resources of high scientific, cultural, or ecological value; such resources will be preserved in the most appropriate way—in situ or by extraction; very low tolerance for resource degradation.	Limited access for research purposes or American Indian traditional uses; visitors primarily experience the area through interpretation and educational programming in other areas; paleontological quarry area developed for research and educational purposes.	Management actions focus on resource values and research benefits.	Development temporary; done to support safety of researchers and scientific research, American Indian traditional practices, or preservation of the resource.
				

Management Zone	Desired Resource Condition	Desired Visitor Experience and Visitor Uses	Kind and Level of Management Activities	Kind and Level of Development
Development	<p>Natural resources are preserved to the degree possible, while allowing development in a naturally compatible manner; resources could be modified to provide for visitor access, park operations, and administrative needs; development zone would not be placed in areas with sensitive natural or cultural resources; cultural and paleontological resources are provided maximum protection through inventories/surveys and mitigation prior to actions that could disturb them.</p>	<p>Visitor services and orientation focused on an overview of park's purpose and significance; visitors have access to concessions, developed campgrounds, restrooms, lodging, food service, and sales; high level of interaction with other visitors, groups, and park staff; visitors could encounter many human sounds and activities; visitor education self-directed or ranger led; visitor use in this zone generally highly structured; sightseeing walks, educational programs, viewing resources, organized activities common; camping in designated areas; appropriate visitor services could be permitted.</p>	<p>Management activities focused on visitor orientation, education, and safety; infrastructure maintained.</p>	<p>Orientation and interpretation facilities such as visitor centers, visitor contact stations, wayside exhibits, and interpretive media appropriate; restrooms and picnic facilities present; access to public areas easy; public access to housing, maintenance, and administration might be restricted.</p>
				

USER CAPACITY

General management plans for national park system units must address user capacity management. The NPS defines user capacity as the type and extent of use that can be accommodated while sustaining the quality of a park unit's resources and visitor experiences consistent with the park unit's purpose.

User capacity management involves establishing desired conditions, monitoring, and taking actions to ensure that the park unit's values are protected. The premise is that with any visitor use comes some level of impact that must be accepted; therefore, it is the responsibility of the NPS to decide what level of impact is acceptable and what management actions are needed to keep impacts within acceptable limits.

Instead of just tracking and controlling the number of visitors, staff manages the levels, types, and patterns of visitor use as needed to preserve the condition of the resources and quality of the visitor experience. The monitoring component of this process helps staff evaluate the effectiveness of management actions and provides a basis for informed adaptive management of visitor use.

The foundation for user capacity decision making is the qualitative description of desired resource conditions, visitor experience opportunities, and general levels of development and management described in the management zones. Based on these desired conditions, indicators and standards are identified. An indicator is a measurable variable that can be used to track changes in resource and social conditions related to human activity so that existing conditions can be compared to desired conditions. A standard is the minimum acceptable condition for an indicator.

User capacity decision making is a continuous process; decisions are adjusted based on monitoring the indicators and standards. Management actions are taken to minimize impacts when needed. The indicators and standards included in this EMP/EIS would generally not change in the future. However, as monitoring of the park's conditions continues,

managers may decide to modify, add, or delete indicators if better ways are found to measure important changes in resource and social conditions. Information on the monitoring efforts, related visitor use management actions, and any changes to the indicators and standards would be available to the public.

With limited staffs and budgets, managers must focus on areas where there are definite concerns and/or clear evidence of problems. This means monitoring should generally take place where conditions are approaching standards or violate standards, conditions are changing rapidly, specific and important values are threatened by visitation, and/or the effects of management actions taken to address impacts are uncertain.

This GMP/EIS

- Identifies park purpose and significance, which establishes the basic framework for all aspects of future planning and management of the park, including determining the user capacity of areas within the park.
- Describes management zones that provide the basis for managing user capacity. Each zone prescribes desired resource conditions, visitor experiences, and recreational opportunities for different areas of the park. The zones also prescribe the types and levels of developments necessary to support these conditions, experiences, and opportunities. This element of the framework is the most important to long-term user capacity management because it directs the park managers on ways to best protect resources and visitor experiences while offering a diversity of visitor opportunities.
- Evaluates the tradeoffs of having different proportions and distributions of management zones via the alternatives and it identifies a preferred alternative that will give park managers a course of action for managing park resources over the next 15 to 20 years.

- Describes the park's most pressing use-related resource and visitor experience concerns, existing and potential, given the park's purpose, desired conditions, and the vulnerability of specific resources and values. This helps managers focus limited resources on the most significant user capacity indicators.
- Provides park managers focus on the areas where they need to begin developing indicators, establishing standards and collecting baseline data and representative examples of management strategies to avoid or minimize unacceptable impacts from visitor use are identified.

The last steps in the user capacity process, which will continue indefinitely, involve monitoring the South Unit's indicators and taking management actions as needed to minimize impacts. As a means for providing flexibility in the face of changing conditions, managers will use an adaptive management approach when appropriate. (Adaptive management is a management system based on clearly identified outcomes, monitoring to determine if management actions are meeting outcomes, and if not, making changes that will best ensure that outcomes are met or that outcomes are reevaluated.) If new use-related resource or visitor experience concerns arise in the future, additional indicators and standards will be identified as needed to address these concerns.

POTENTIAL USER CAPACITY INDICATORS AND STANDARDS

The following have been chosen out of many possible indicators because they address the type and levels of visitor use expected over the life of this document. These indicators apply to all the management zones, and reflect the different levels of use appropriate to different zones. The potential priority resource indicators selected are associated with the disturbance of, and damage to paleontological features and archeological sites, significant changes in visitor use to the backcountry of the South Unit given the potential for impacts to sensitive resources in areas that currently receive little to no visitor use, and visitor satisfaction.

Table 2 describes the user capacity indicators, standards, monitoring and management strategies for the South Unit. This information was developed after careful consideration of key aspects of desired resource conditions and visitor experiences, public scoping information, relevant research studies, staff management experience and other park data sources. The planning team considered many potential issues and related indicators that would identify impacts of concern, but those described below were considered the most salient given the importance and vulnerability of the resource or visitor experience affected by visitor use.

TABLE 2. POTENTIAL INDICATORS, STANDARDS, MONITORING, AND MANAGEMENT ACTIONS

Management Zone	Indicators	Standards	Monitoring	Management Actions
All	<p>Resource impacts including adverse impacts to paleontological sites, trails, archeological sites, and vegetation.</p> <p>Number of incidents resulting in a criminal violation and warnings related to resource damage.</p> <p>Number of informal trails.</p>	<p>No new observable or measurable adverse impacts or damage to paleontological features (baseline values).</p> <p>No incidents resulting in criminal violations and few warnings.</p> <p>No informal trails.</p>	<p>Staff observations, visitor complaints, remote sensing, and photo surveys.</p> <p>Law enforcement patrols and evaluation of violation logs.</p> <p>Conduct informal trail surveys every 3–5 years to determine the extent of disturbance.</p>	<p>Increased enforcement and visitor contacts; increased education about the sensitivity of paleontological resources and promotion of low impact visitor use practices through informal contact and formal programming; change site management techniques (e.g., fences, barriers, sensors and monitoring devices); area or temporal closures; implement permit systems.</p>
All	<p>Visitor satisfaction.</p>	<p>Visitor satisfaction scores related to visitor interactions are similar to other parks</p>	<p>Visitor survey results or periodic special visitor use studies (10 years – University of Idaho co-op studies) and visitor complaints</p>	

ALTERNATIVES

Many aspects of the desired future conditions for the South Unit are defined in the establishing legislation, the purpose and significance statements, and the servicewide mandates and policies described previously in this document. Within these parameters, the NPS solicited input from Tribal officials, Tribal members, the public, park staff, government agencies, and other organizations regarding issues and desired conditions for the park.

Planning team members gathered information about the park's resources, visitor activities, and the condition of the park's facilities. They considered which areas of the park attract visitors and which areas have sensitive resources. Using that information, the planning team developed multiple zones for guiding the management of the South Unit and its resources. The management zones are applied in varying combinations and locations in the action alternatives. These zones, described below, form the basis of the alternatives for the South Unit GMP/EIS.

The NPS developed three action alternatives and the No-Action Alternative to reflect the range of ideas proposed by the South Unit GMP/EIS team and the public. Each alternative consists of the following elements:

- Natural and cultural resource management.
- Visitor use and experience management.
- Visitor access and enjoyment.
- Staffing and cost.

The NPS would continue to follow existing servicewide mandates, laws, and policies under each of the action alternatives and the No-Action Alternative. Those mandates and policies are not

repeated in this chapter. However, the management actions proposed in the alternatives do differ, and they are discussed in this chapter.

The action alternatives focus on what the resource conditions in the South Unit should be and which visitor experiences and opportunities should be available. The alternatives do not address the details of how these conditions and experiences should be achieved. More detailed plans or studies would be necessary before the developments or actions proposed in the alternatives could be built. As detailed plans or studies are implemented, individual environmental documents would be tiered off of this GMP/EIS.

The four alternatives presented here embody the range of input from the public and the NPS with regard to visitor experience/access, natural resource management, cultural resource management, and staffing and cost at the South Unit. The alternatives were created by establishing management zones to meet the various management goals.

In some cases, all action alternatives apply the same management prescription to the same area, as detailed in the "Elements Common to All Action Alternatives" section in this chapter.

For purposes of this GMP/EIS, a visitor center is a staffed permanent structure with a roof and four walls that houses an information desk, temporary and permanent exhibits, and public restroom facilities. A visitor contact station may have a roof and four walls, but it could be a two- or three-sided roofed structure, generally unstaffed, with informational exhibits or wayside-type displays, and no public restroom facilities. An entrance station has fee collection booths and may have a support building, which is generally not available to the public.

RESOURCE AND VISITOR EXPERIENCE ALTERNATIVES

The alternatives, each of which is consistent with maintaining the South Unit's purpose, significance, and fundamental resources and values, present different choices for how to manage resources, visitor use, and facilities within the South Unit. The alternatives as presented on the following pages would not change regardless of who (NPS or OST) manages the park in the future. The same resource management, visitor use and experience, staffing, and facility goals and needs would remain unchanged. All costs presented in the alternatives are based on the concept that the alternative has been fully implemented, and costs are based on 2010 dollars. The estimated costs provided are for alternative comparison purposes only. These costs are not to be used for programming and budgeting purposes.

ALTERNATIVE A: NO ACTION (CONTINUE CURRENT MANAGEMENT)

The No-Action Alternative primarily reflects current conditions and activities at the South Unit. This alternative is provided as a baseline against which to compare the action alternatives. Management zones, which are prescriptive (that is, they describe desired conditions for the future), would not be applied for the No-Action Alternative (refer to the alternative A map).

Resource Management

Under the No-Action Alternative, the NPS would not have an active restoration program. Presently, any restoration activity is conducted on an as-needed basis. The range survey currently underway on Range Unit 505 to determine management needs would continue until complete. Vegetation and wildlife surveys would be conducted as warranted, including annual surveys of pronghorn, deer, and bighorn sheep by the Oglala Sioux Parks and Recreation Authority (OSPRA). Mapping of prairie dog towns through the use of global positioning systems (GPS) and geographic information systems (GIS) would continue. Exotic plant

species would be managed and/or native plant populations would be reintroduced on an as-needed basis.

The OST grazing leases would remain intact. Grazing would continue throughout the South Unit. Although grazing leases allow for bison, lessees do not currently graze bison in the South Unit. All grazing leases in the South Unit are managed by the BIA, except those in Range Unit 505.

No existing paleontological locations would be surveyed and the moratorium on paleontological collecting would remain in effect unless removed by the OST. Fossil collections would continue to be housed at the South Dakota School of Mines and Technology and in other off-site repositories.

No additional archeological surveys would be conducted unless necessary to meet *National Historic Preservation Act* compliance activities. Interpretation of Oglala Sioux history and culture would continue at the White River Visitor Center.

Programs to emphasize the preservation of Oglala Lakota language and culture would not be initiated. Historical exhibits would remain at the White River Visitor Center, which is staffed by OSPRA employees.

Visitor Use and Experience

The NPS and the OST would continue to share the responsibility for managing the White River Visitor Center. The visitor center would remain open in June, July, and August and would continue to be staffed by OSPRA personnel. The NPS would continue to design the exhibits, with OST input. The Bombing Range would continue to be interpreted through exhibits and programs. There would be few if any changes in the number of exhibits or interpretive staff at the White River Visitor Center. Interpretive activities and visitor education would be shared with the NPS.

Visitor Access and Enjoyment

No organized recreational opportunities, such as guided tours, developed hiking trails, or camping facilities (or areas designated for that purpose), would be provided.

Existing two-track roads would continue to provide access to the South Unit, and would not be improved or expanded.

No formal restrictions would be imposed by the park on use or visitation in ceremonial and other cultural sites of the South Unit. No interpretation of these areas would be provided.

Reliable potable water would be available only at the White River Visitor Center, where it is available through existing wells.

Staffing and Cost

The staffing level under the No-Action Alternative would continue to be the equivalent of two full-time staff members; this number is equal to the current 2010 staffing level.

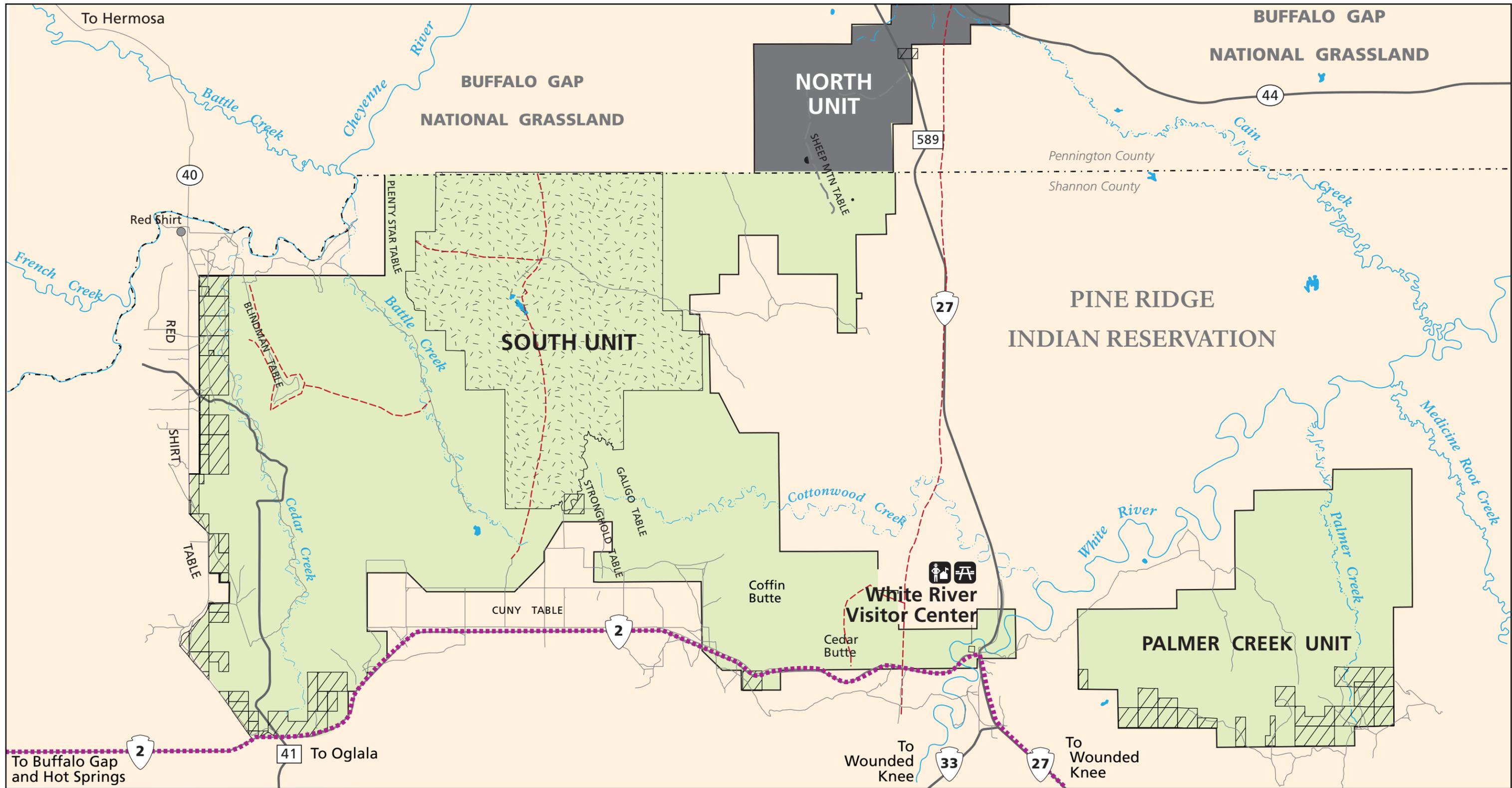
Under the No-Action Alternative, no new development is planned. The White River Visitor Center would be maintained as it is currently maintained. Scheduled cyclical maintenance would continue to take place as the budget allows. Development of the Lakota Heritage and Education Center (LHEC) would continue as funding permits. For more details concerning the LHEC refer to the “Elements Common to All Action Alternatives” section in this chapter. At this no improvements are planned for the South Unit.

The cost estimates provided here are given for comparison purposes only; they are not to be used for budgeting purposes. The park proposed a budget total of approximately \$160,000 in fiscal year (FY) 2009, encompassing salaries, travel, and supplies. The park anticipates a budget of approximately \$183,000 for FY 2010. Vacancies would be filled as funding permits. For a comparison of the cost of staffing needs between alternatives, refer to appendix D.

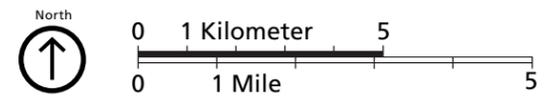
ALTERNATIVE B: EXPAND INTERPRETIVE OPPORTUNITIES

Alternative B primarily focuses on expanded access and opportunities for visitors to the South Unit. Opportunities include interpretation of natural and cultural resources. The designated management zoning reflects this focus and would be delineated as follows (refer to the alternative B map):

- **Natural Area / Recreation Zone.** Approximately 89 percent of the lands within the South Unit would be designated as Natural Area / Recreation Zone, which would represent the basic core or center of the park and the Palmer Creek Unit. This zone would include primitive campgrounds, backcountry patrol / equestrian facilities, and access by paved and unpaved pedestrian and horseback-riding trails. Visitors would have the opportunity to freely hike and camp with very limited controls or encounters with other visitors. This zone would provide a sense of remoteness, intimacy, and solitude.
- **Development Zone.** Approximately 11 percent of the lands located along the park perimeter would be designated as the Development Zone. Within this zone, visitors would experience the greatest level of development and frequent contact with other visitors and uniformed park staff. This is the area where visitors would receive information, orientation, education, and visitor services. Developments, such as small wayside parking areas and related facilities, would be carefully tucked into the landscape so as not to become obtrusive. Such areas would offer visitors the opportunity to leave their vehicles and take advantage of interpretive exhibits and short hiking trails. Resources would be intensely managed to preserve and protect the natural and cultural values of the zone while providing a variety of amenities.

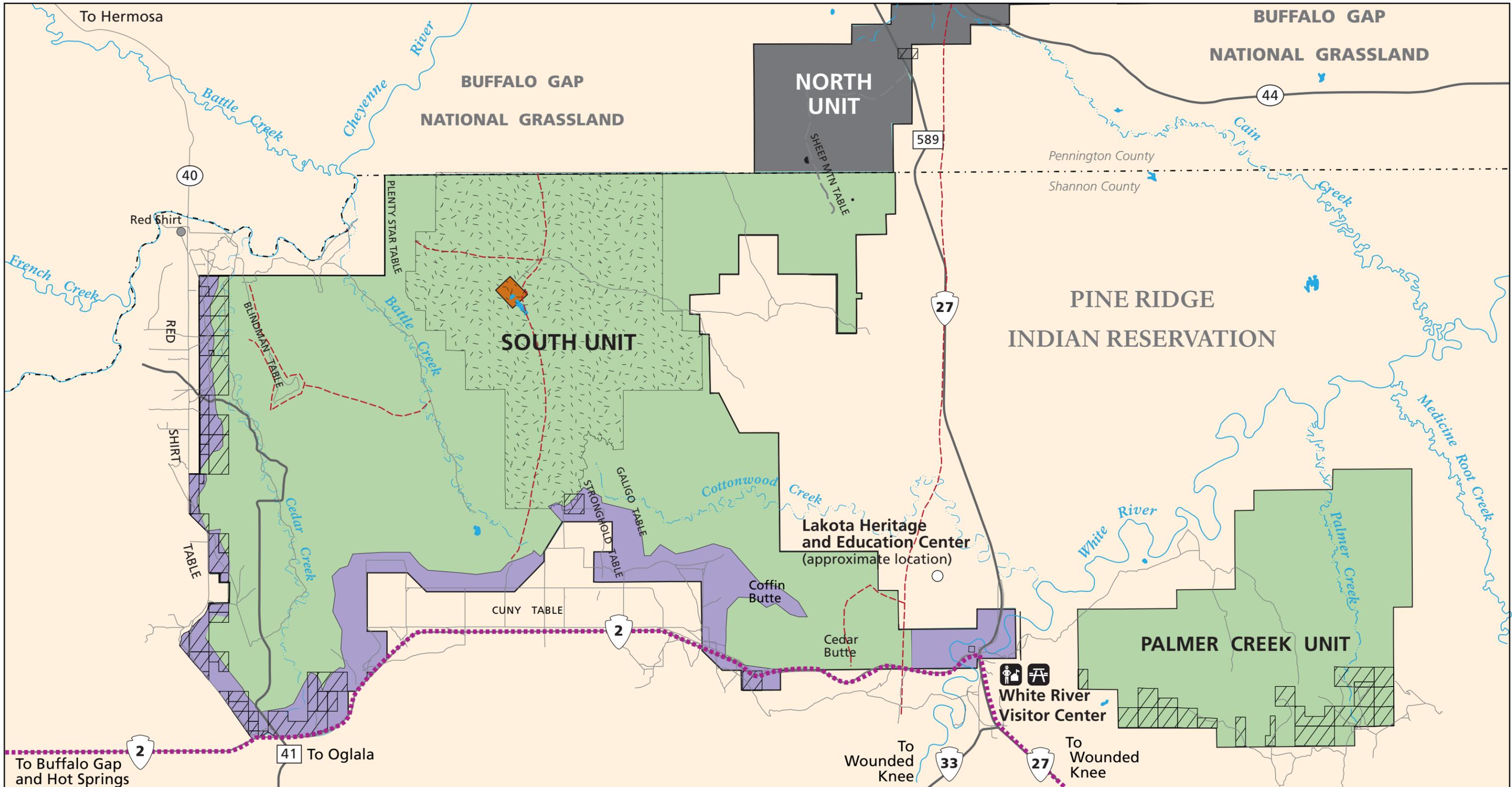


Pine Ridge Indian Reservation Boundary	Trail	Ranger station
Crazy Horse Scenic Byway	Overlook	Restrooms
Unpaved road	Park North Unit	Picnic area
Unpaved road (passable only when dry)	Park South Unit	Self-guiding trail
Paved road	Private Lands	Campground
	Range Unit 505	Primitive campground

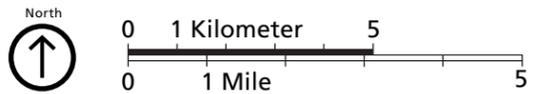


ALTERNATIVE A
No Action

BADLANDS NATIONAL PARK
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Pine Ridge Indian Reservation Boundary	Trail	Natural Area Recreation Zone
Crazy Horse Scenic Byway	Overlook	Preservation Zone
Unpaved road	Park North Unit	Research Zone
Unpaved road (passable only when dry)	Private Lands	Development Zone
Paved road	Range Unit 505	Ranger station
		Picnic area



ALTERNATIVE B
 EXPAND INTERPRETIVE OPPORTUNITIES

BADLANDS NATIONAL PARK
 United States Department of the Interior / National Park Service

- **Research Zone.** Less than 1 percent of the park would be designated as the Research Zone, located in the north-central part of the park. Within this zone, there would be limited access for research purposes or American Indian traditional uses. Visitors would primarily experience the area through interpretation and educational programming in other areas. The paleontological quarry area would be developed for research and educational purposes. Development would be temporary and done to support paleontological research and provide for the visitor health and safety. Visitors would have the opportunity to gain understanding about the value of research and the process of caring for paleontological resources.

Resource Management

Under alternative B, park managers would develop active restoration programs. Surveys would be developed for all resources, including fossil resources, cultural resources, wildlife, and vegetation, to identify all natural and cultural resources and create databases to support management decisions. Bison would be reintroduced in some areas of the South Unit, depending on existing grazing leases.

Exotic plants would be managed using integrated weed management strategies. Native plants would be reintroduced to disturbed sites. The South Unit would be restored to natural conditions (where necessary) by removing exotic species and revegetating disturbed sites with native plants.

The grazing leases would remain intact into the foreseeable future and would be managed to ensure the sustainability of native vegetation. The long-range goal would be to eliminate grazing in Range Unit 505, which is the range unit most suitable for near-wilderness conditions.

Surveys of existing and new paleontological locations would be conducted. The moratorium on paleontological collecting would be lifted.

One active quarry would be open to visitor viewing. Paleontology digs, monitored by trained park personnel, might be observed by visitors. All fossils collected from quarry operations and associated surveys would be prepared and curated by trained park personnel. As appropriate, newly collected fossils and the specimens from the quarry and surveys would be stored in an off-site museum until the LHEC museum is fully operational. The existing fossil collection would remain housed in off-site repositories, such as the South Dakota School of Mines and Technology. Park personnel would collect fossils deemed to be at risk of theft or erosion. Where feasible, fossils would be cast for exhibit. Paleontological and geological resources would be protected from poaching through increased law enforcement patrols.

Surveys and inventories of archeological resources would be developed and findings documented. Interpretation of Oglala Sioux history and culture would continue at the White River Visitor Center.

Priority would be placed on developing and expanding a cultural resource survey to better protect and preserve cultural, historic, and spiritual sites and materials. Interpretation would be available at some cultural sites across the South Unit, and programs offered by Tribal members would focus on aspects of Oglala Sioux history and culture. Historical exhibits would remain on display at the White River Visitor Center, which would be staffed by Tribal employees. There would be few, if any, changes in the number of exhibits or interpretive staff at the White River Visitor Center.

Visitor Use and Experience

Visitor centers would be staffed by park personnel. Seasonal operations would continue under alternative B. The NPS would continue to design exhibits, with OST input. In alternative B, interpretive opportunities would be offered to visitors in a variety of new ways:

- Historic and cultural interpretive opportunities would include activities such as powwows and ceremonies. At some cultural or ceremonial sites, as

well as at campgrounds, interpretive activities would be presented so visitors could learn more about the Lakota culture and history. Programs would feature Tribal members who wear and explain traditional dress, and storytelling and oral history would be presented by Tribal elders.

- Oglala guides would conduct travel into the backcountry and less-developed areas. The guides would interpret natural resources, the history of the area, Oglala culture, and traditional Lakota land management.
- Paleontology digs, monitored by trained park personnel, might be observed by visitors, and outdoor classrooms might be offered by the staff.
- Interpretive signs would be placed along roads to identify locations, animals and plants, historic locations, and mileages.

Visitor Access and Enjoyment

A more reliable potable water supply would be developed for facilities in the vicinity of the White River Visitor Center. Future evaluations would be made to explore the possibility of a campground and concession development near the White River Visitor Center. Recreational opportunities would be available through guided trail rides, and hiking trails and campsites would be established. Hiking would be allowed on some primitive trails, with limited access to the Palmer Creek Unit. Primitive camping would allow for unguided camping experiences, and limited overnight backpacking by permit. Visitors could plan and schedule backcountry camping trips at a backcountry contact station / visitor center. Guided horse camping trips would be offered. Developed camping would be provided. A backcountry ranger patrol station with equine facilities would be developed in the interior, most likely on the west side of the park.

Main roads in the South Unit would be improved and perimeter access would be focused in one location with trails, trailheads, parking areas, rest areas with comfort stations, overlooks, and wayside exhibits. Visitors could

explore the South Unit at dispersed visitor access points along the perimeter. The existing road to the quarry area (Research Zone) would be improved and would include parking, restrooms, trailheads, and campsites. Existing two-track roads would continue to provide access to the South Unit. The main roads in the South Unit would be improved. Eco-tours featuring birds and wildlife would be offered.

Hiking and horseback-riding trails would be developed, along with trailheads with parking, comfort facilities, interpretive signs, and informational signage. A mountain-biking trail might be developed. Bicycling along the roads in developed zones would be encouraged in places where bike lanes could be established.

Access would be afforded through the means identified above, thus restricting unguided access to ceremonial and other cultural sites of the South Unit. Interpretation of these areas would be provided by guides.

There would be increased tap-ins of the OST and rural water supplies to provide water for fire protection and campground development. Reliable potable water would be available at the White River Visitor Center.

Staffing and Cost

Full staffing levels under this alternative would be 25 FTEs at a cost of approximately \$1.7 million per year. The total number of staff needed for this alternative would be an increase of 23 positions over the current staffing level. Refer to appendix D for more information concerning the functions, grades, and areas of responsibility for additional staff. This appendix also compares staffing needs of the alternatives.

Volunteers, a key component of a park manager's ability to protect resources and provide high-quality visitor services, would be encouraged. If funding and staffing for some elements of this alternative were substantially reduced or should become unavailable from federal sources, park managers would consider other options, such as expanding the park volunteer program or developing partnerships with other agencies, organizations, businesses, and/or the OST, to accomplish these elements.

One-time facility needs and costs for this alternative are estimated at approximately \$22.2 million. Refer to appendix D for a comparison of one-time facility needs related to each alternative.

One-time non-facility costs include actions for the preservation and interpretation of cultural and natural resources not related to facilities. These are costs that would require substantial funding over and above park annual operating costs. Based on the goals and needs identified in the resource management section of this document, the park has identified certain plans, supporting surveys, and inventories that would be needed to manage resources and provide for visitor use. These plans, surveys, and inventories and related costs are identified in appendix D. The total non-facility cost is estimated to be approximately \$4.7 million.

ALTERNATIVE C: FOCUS ON RESOURCE PROTECTION AND PRESERVATION

Alternative C primarily focuses on preservation and protection of natural and cultural resources, and restoration of natural systems. Access would be limited primarily to the perimeter of the South Unit. Visitor opportunities include interpretation of natural, cultural, and paleontological resources. The designated management zoning reflects this focus and would be delineated as follows (refer to the alternative C map):

- **Natural Area / Recreation Zone.** Approximately 21 percent of the lands in alternative C would be designated as Natural Area / Recreation Zone. This zone would be located on the southwest perimeter of the park and the Palmer Creek Unit. This zone would include primitive campgrounds, backcountry patrol / equestrian facilities, and access by unpaved pedestrian and horseback-riding trails. Visitors would experience the opportunity to freely hike and camp with very limited controls or encounters with other visitors. This zone would provide a sense of remoteness, intimacy, and solitude.

- **Development Zone.** Approximately 2 percent of the lands would be designated as Development Zone. The majority of the development zone would be located in the White River visitor use area and a small amount on Red Shirt Table on the western perimeter of the park. Within this area visitors would experience the greatest level of development and frequent contact with other visitors and uniformed park staff. This is the area where visitors would receive the greatest level of information, orientation, education, comfort, and safety.
- **Preservation Zone.** Approximately 77 percent of the park lands would be designated as Preservation Zone. To access the interior of the South Unit, visitors would need to obtain a permit or guide due to the spiritual and ceremonial value of the resource. This area would offer the highest level of remoteness, intimacy, and sense of solitude found anywhere in the park because of its location and highly controlled access to the public.

Resource Management

Under alternative C, park managers would develop active restoration programs. Surveys would be developed for all resources, including fossil resources, cultural resources, wildlife, and vegetation, to identify all natural and cultural resources and create databases to assist with park management decisions. Natural resource inventories, baseline studies, and monitoring programs would continue in order to inform the efforts to restore the South Unit, and a plan would also be initiated to study the reintroduction of native species, threatened and endangered species, and state species of concern. Bison would be reintroduced in Range Unit 505 of the South Unit to create a preserve/reserve.

Exotic plant species would be managed using integrated weed management strategies. Native plants would be reintroduced to disturbed sites. The South Unit would be restored to natural

conditions (where necessary) by removing exotic species and revegetating disturbed sites with native plants. Management would focus on reintroducing culturally significant plant populations. Vegetation would be surveyed and monitored, with emphasis on rare, threatened, and endangered plants.

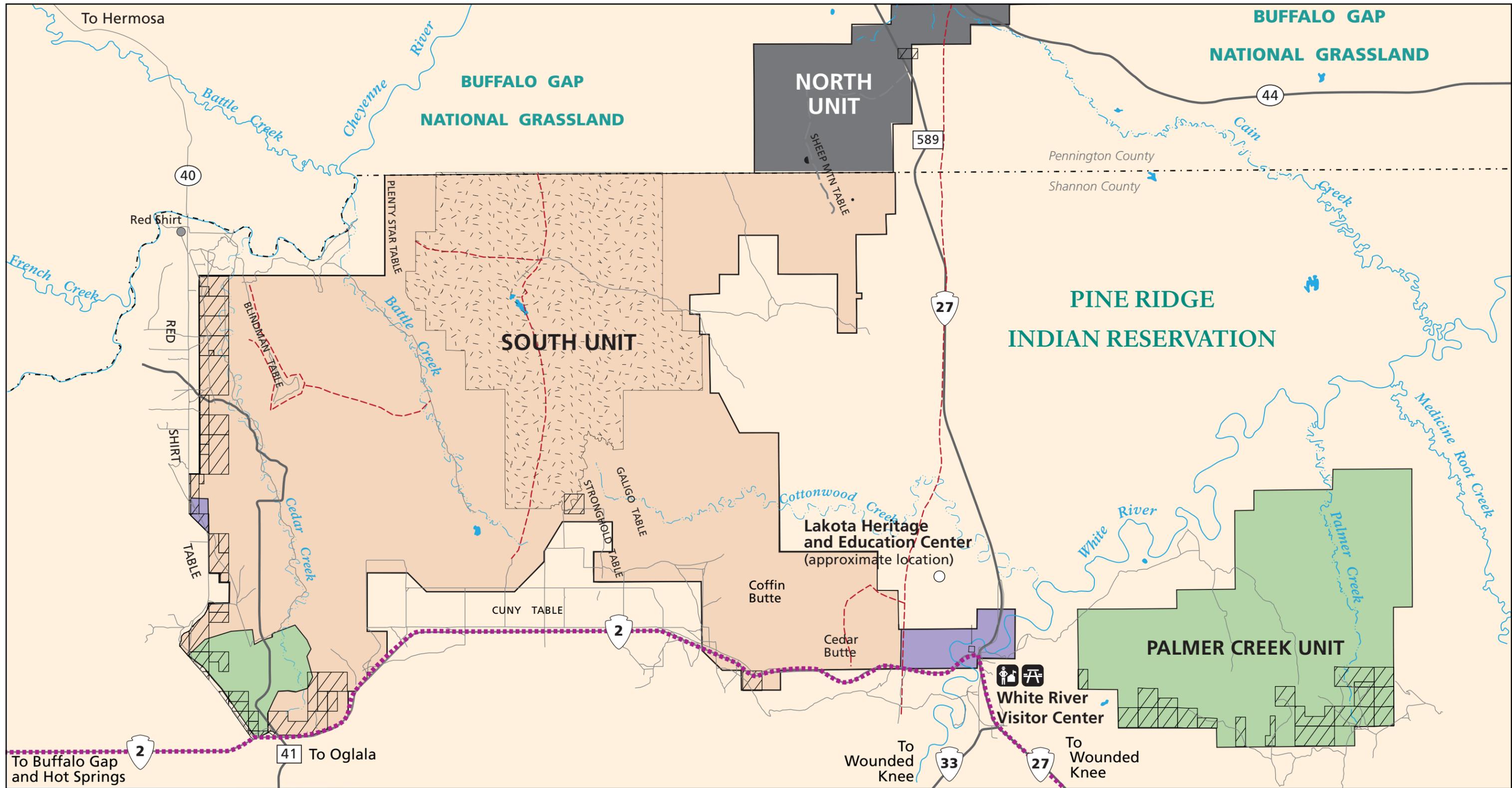
Bison would be reintroduced in Range Unit 505 of the South Unit to create a preserve/reserve. The grazing leases would remain intact into the foreseeable future, but would gradually be eliminated.

Surveys of existing and new paleontological locations would be conducted. The moratorium on paleontological collecting would be lifted. All fossils collected during surveys would be prepared and curated by trained park personnel. As appropriate, newly collected fossils from surveys would be stored in an off-site museum until the LHEC museum is fully operational. Where feasible, all known artifacts and fossil specimens that have been acquired from the South Unit would be located, retrieved, and housed in a museum at the LHEC. Park

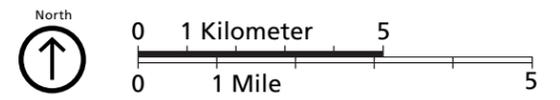
personnel would collect fossils deemed to be at risk of theft or erosion. Where feasible, fossils would be cast for exhibit. Paleontological and geological resources would be protected from poaching through increased law enforcement patrols.

Priority would be placed on developing and expanding a cultural resource survey and on protecting and preserving cultural materials, including archeological and fossil sites, and medicinal and edible plants (ethnobotanicals).

Cultural resources would be documented and assessed for significance. Efforts would be made to identify and preserve cultural, historical, and spiritual sites, and visitation would be restricted in sacred areas. Areas would be set aside for ceremonial purposes and would be available to visitors only at certain times. Powwows might be held, but no facility would exist expressly for that purpose. Interpretation of Oglala Sioux history and culture would continue at the White River Visitor Center and the LHEC museum.



Pine Ridge Indian Reservation Boundary	Trail	Natural Area Recreation Zone
Crazy Horse Scenic Byway	Overlook	Preservation Zone
Unpaved road	Park North Unit	Research Zone
Unpaved road (passable only when dry)	Private Lands	Development Zone
Paved road	Range Unit 505	Ranger station
		Picnic area



ALTERNATIVE C
FOCUS ON RESOURCE PROTECTION & PRESERVATION
BADLANDS NATIONAL PARK
 United States Department of the Interior / National Park Service

Visitor Use and Experience

Visitor centers would be staffed by park personnel. Seasonal operations would continue in alternative C. The NPS would continue to design exhibits, with OST input. In alternative C, interpretive opportunities would be offered to visitors in a variety of new ways:

- Promote a better understanding of Lakota culture through a variety of education and interpretive offerings, such as living history and opportunities to meet with, listen to, and talk with Tribal elders, spiritual leaders, and native interpreters. Vista points around the perimeter would include wayside exhibits on the cultural importance of ethnographic resources.
- Alternative C would emphasize the preservation of Lakota language and culture through a variety of education and interpretation programs, such as family history and living history, monuments that memorialize events in Lakota history, and exhibits that emphasize native background and history. There would be a focus on elders and spiritual leaders. The Lakota language and Oglala culture would be incorporated into programs, interpretive displays, and wayside exhibits. Bilingual (English and Lakota) signs would be used on roads, in interpretive displays, and elsewhere.
- Historic and cultural discovery would occur at activities such as powwows and ceremonies. At some cultural or ceremonial sites, as well as at campgrounds, interpretive activities would be presented so visitors could learn more about the Lakota culture and history. Programs would feature Tribal members who wear and explain traditional dress, and story-telling and oral history would be presented by Tribal elders.
- The exhibits at the White River Visitor Center would be improved and

expanded and an entrance station would be developed in the vicinity of the White River Visitor Center. A visitor contact station would also be developed on the west side of the South Unit.

Interpretation and orientation information would also be available at the LHEC.

Visitor Access and Enjoyment

Alternative C envisions developing a new visitor contact station in the vicinity of the White River Visitor Center and in the general location of the LHEC. For more details concerning the LHEC refer to the “Elements Common to All Action Alternatives” section in this chapter. Some of these exhibits would focus on the cultural importance of ethnographic resources. The Lakota language and Oglala culture would be incorporated in the programs, interpretive displays, and wayside exhibits. An entrance station would be developed in the vicinity of the White River Visitor Center, and staff housing, which includes a ranger residence and maintenance area, would be expanded and improved to accommodate the increase in staff.

A museum for artifacts, fossil resources, and natural history specimens would be part of the LHEC.

Recreational opportunities would be available through guided trail rides and hiking trails and primitive campsites established along the southwest perimeter of the park and within the Palmer Creek Unit. Hiking would be allowed on some primitive trails in the Natural Area / Recreation Zone, with limited access to the Palmer Creek Unit. Primitive camping would be allowed by permit in designated areas in the Natural Area / Recreation Zone. Visitors (with permits) could plan and schedule guided backcountry camping trips into the interior at a backcountry contact station / visitor center. Guided horse camping trips would be offered. Developed camping would be provided in the Development Zone.

Visitors could explore the South Unit at dispersed visitor access points along the perimeter. A backcountry ranger patrol station

with equine facilities would be developed in the interior, most likely on the west side of the park.

To limit the impacts on the natural and cultural environment, development and visitor activities would be restricted mostly to the perimeter of the South Unit. Developed perimeter access would be focused in one location with trails, trailheads, parking areas, rest areas with comfort stations, overlooks, and wayside exhibits. Minimal development would accommodate primitive camping in the Natural Area / Recreation Zone in the southwestern portion of the South Unit. Where bike lanes could be safely provided, bicycling along the roads in developed zones would be encouraged. There would not be any improved roads providing access to the interior.

The existing two-track roads would continue to provide administrative access to the South Unit, and would undergo only minimal improvement.

Park management would institute a permit and reservation system for unguided access into the interior. Guided trail tours would take visitors to select areas in the interior. Unguided access to ceremonial and other cultural sites of the South Unit may be restricted at certain times; interpretation of these areas would be provided primarily by guides. There would be off-site interpretation of cultural and sacred sites. Pristine areas would be set aside for limited access through guided tours only.

Access would be afforded through the means identified above, thus restricting unguided access to ceremonial and other cultural sites of the South Unit.

There would be increased tap-ins of the OST and rural water supplies to provide water for fire protection and campground development. Reliable potable water would be available at the White River Visitor Center.

Staffing and Cost

Full staffing levels under this alternative would be 21 FTEs at a cost of approximately \$1.6 million per year. The total number of staff needed for this alternative would be an increase of 19 positions over the current staffing level. Refer to appendix D for more information concerning the functions, grades, and areas of responsibility for additional staff. This appendix also compares staffing needs between the alternatives.

Volunteers, a key component of a park manager's ability to protect resources and provide high-quality visitor services, would be encouraged. If funding and staffing for some elements of this alternative were substantially reduced or should become unavailable from federal sources, park managers would consider other options, such as expanding the park volunteer program or developing partnerships with other agencies, organizations, businesses, and/or the OST, to accomplish these elements.

One-time facility needs and costs for this alternative are estimated at approximately \$11.3 million. Refer to appendix D for a comparison of one-time facility costs related to each alternative.

This cost includes actions for the preservation and interpretation of cultural and natural resources not related to facilities. These are costs that would require substantial funding over and above park annual operating costs. Based on the goals and needs identified in the resource management section of this document, the park identified certain plans, supporting surveys, and inventories, described in appendix D that would be necessary to manage park resources and provide for visitor use. The total non-facility cost would be \$4.7 million.

ALTERNATIVE D: PROTECT RESOURCES WHILE EXPANDING INTERPRETIVE EXPERIENCE (PREFERRED ALTERNATIVE)

Alternative D (the preferred alternative) primarily focuses on restoration of natural ecosystems with expanded access and recreational opportunities for visitors. Additional opportunities would include interpretation of natural, cultural, and paleontological resources. The preferred alternative would promote understanding of Oglala Sioux history, culture, and land management principles through education and interpretation. Visitor activities would be focused in a developed front-country area that would provide a variety of services and amenities around the perimeter, while the interior of the South Unit would be managed as backcountry. Natural resources management would focus on survey and research to provide data to support future restoration, interpretation, and educational activities. Cultural resources management would focus on protection and preservation of historic, spiritual, and ceremonial sites and materials.

Management might seek easements or rights-of-way to gain access to some areas that are currently surrounded by private property. The designated management zoning reflects this focus and would be delineated as follows (refer to the alternative D map):

- **Natural Area / Recreation Zone.** Approximately 90 percent of the lands within the park would be designated as Natural Area / Recreation Zone. This zone would include primitive campgrounds, backcountry patrol / equestrian facilities, and access by unpaved pedestrian and horseback-riding trails. Visitors would have the opportunity to hike and camp with limited controls and few encounters with other visitors. This zone would provide a very high sense of remoteness, intimacy, and solitude.
- **Development Zone.** Approximately 10 percent of the lands, located on the perimeter of the park, would be

designated as Development Zone. Within this area, visitors would experience the greatest level of development and frequent contact with other visitors and uniformed park staff. This is the area where visitors would receive information, orientation, education, and visitor services. Developments, such as small wayside parking areas and related facilities, would be carefully tucked into the landscape so as not to become obtrusive. Such areas would offer visitors the opportunity to leave their vehicles and take advantage of interpretive exhibits and short hiking trails. Resources would be intensely managed to preserve and protect the natural and cultural values of the zone while providing a variety of amenities.

- **Research Zone.** Less than 1 percent of the park would be designated as the Research Zone, located in the north-central part of the park. Within this zone, visitors would experience a highly controlled environment, with opportunities to access and view an active research quarry. Development would be temporary and done to support paleontological research and provide for visitor health and safety. Visitors would have the opportunity to gain understanding about the value of research and the process of caring for paleontological resources.

Resource Management

Under alternative D, the NPS would develop active restoration programs. Surveys would be developed for all resources, including fossil resources, cultural resources, wildlife, and vegetation, to identify all natural and cultural resources and create databases to support management decisions. Surveys, inventories, studies, and monitoring programs would be initiated to inform the planning efforts to restore the South Unit and reintroduce native species, threatened and endangered species, and state species of concern. Bison would be reintroduced

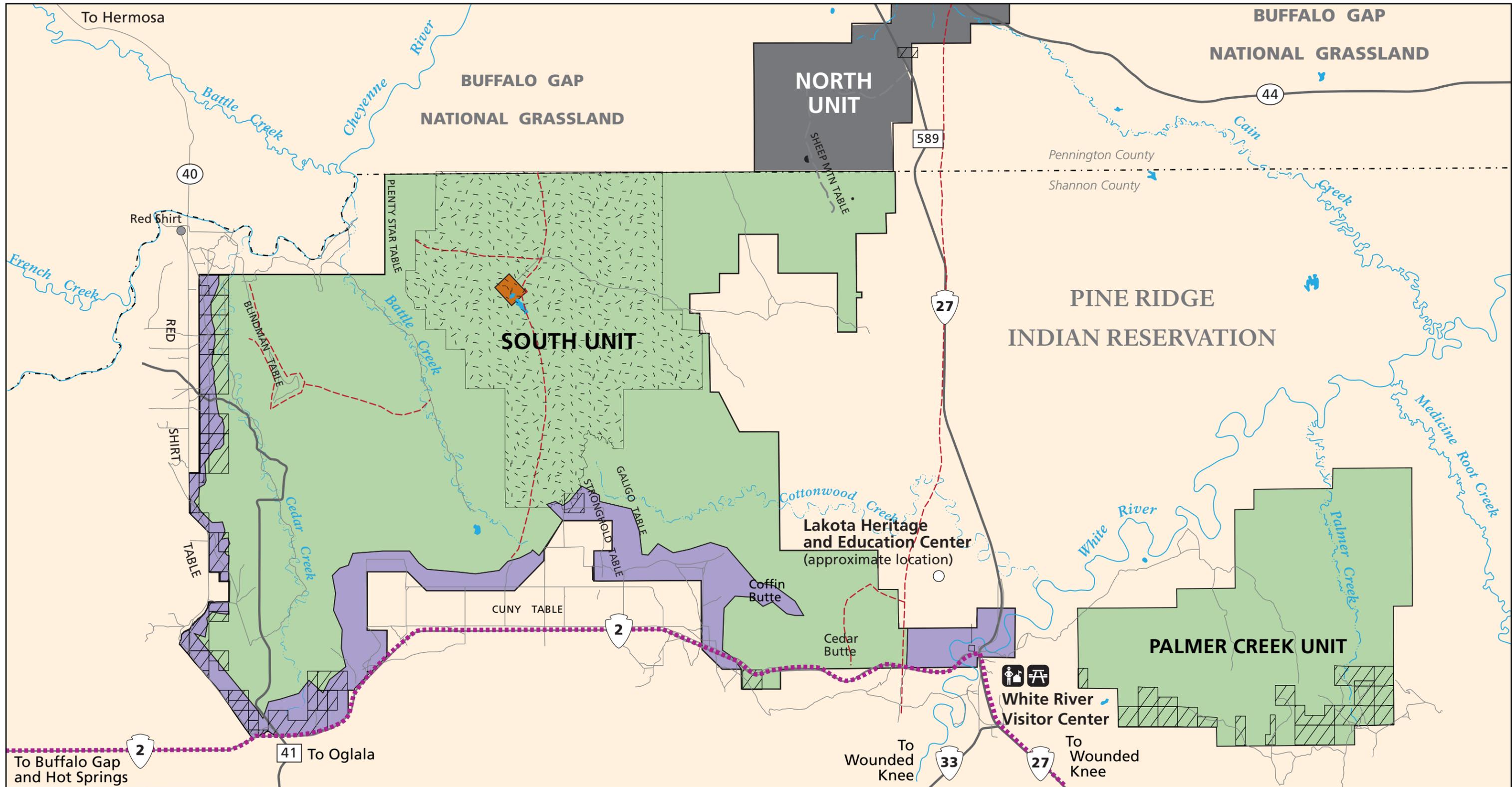
in the White River visitor use area for demonstration purposes, and in Range Unit 505 to create a bison preserve/reserve. In furtherance of that goal, grazing leases in other areas would remain intact until phased out or replaced by bison leases or a Tribal bison herd. Associated corrals and handling facilities would be developed to manage bison.

Exotic plants would be managed and/or native plant populations would be reintroduced. The South Unit would be restored to natural conditions (where necessary) by removing exotic species and revegetating disturbed sites with native plants. Management would focus on reintroducing culturally significant plant populations. Vegetation would be surveyed and monitored, with emphasis on rare, threatened, and endangered plants.

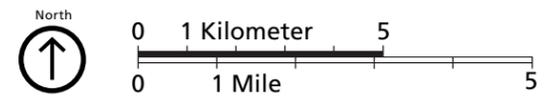
Existing and new paleontological locations would be surveyed. The moratorium on paleontological collecting would be lifted. One active quarry would be open to visitor viewing. Paleontology digs, monitored by trained park personnel, might be observed by visitors. All fossils collected from quarry operations and associated surveys would be prepared and curated by trained park personnel. As appropriate, newly collected fossils and the specimens from the quarry and surveys would be stored in a location deemed appropriate by the OST. Where feasible, all known artifacts and fossil specimens that have been acquired from the South Unit would be located, retrieved, and

housed in a museum at the LHEC. Park personnel would collect fossils deemed to be at risk of theft or erosion. Where feasible, fossils would be cast for exhibit. Paleontological and geological resources would be protected from poaching through increased law enforcement patrols.

Priority would be placed on developing and expanding a cultural resource survey and on protecting and preserving cultural materials and medicinal and edible plants (ethnobotanicals). Cultural resources would be documented and assessed for significance. Attempts would be made to research and investigate locations and conditions of collections of archeological resources that have been removed from the South Unit. Where feasible, those collections or items would be returned and housed in the South Unit. Efforts would be made to identify and preserve cultural, historic, and spiritual sites, and visitation would be restricted in sacred areas. Some cultural and ceremonial sites would be closed to non-Tribal members. Interpretation of cultural and ceremonial sites would take place outside of those sites. Other areas that might be set aside for ceremonial purposes would be available to visitors only at certain times. Powwows might be held, but no facility would exist expressly for that purpose. Interpretation of Oglala Sioux history and culture would continue at the White River Visitor Center and the LHEC museum.



- | | | |
|----------------------------------------|-----------------|------------------------------|
| Pine Ridge Indian Reservation Boundary | Trail | Natural Area Recreation Zone |
| Crazy Horse Scenic Byway | Overlook | Preservation Zone |
| Unpaved road | Park North Unit | Research Zone |
| Unpaved road (passable only when dry) | Private Lands | Development Zone |
| Paved road | Range Unit 505 | Ranger station |
| | | Picnic area |



ALTERNATIVE D
 PROTECT RESOURCES WHILE EXPANDING
 INTERPRETIVE EXPERIENCE (PREFERRED ALTERNATIVE)
 BADLANDS NATIONAL PARK
 United States Department of the Interior / National Park Service

Visitor Use and Experience

Visitor centers would be staffed by park personnel. Seasonal operations would be expanded. The NPS would continue to design the exhibits, with OST input. In the preferred alternative (alternative D), interpretive opportunities would be offered to visitors in a variety of new ways:

- Emphasis on the preservation of Lakota language and culture through a variety of education and interpretation programs, such as family history and living history, monuments that memorialize events in Lakota history, and wayside exhibits that emphasize native background and history would occur. Exhibits at the visitor contact station and the LHEC would include information about Oglala Sioux history and culture. A living history village would be created. Visitors would be able to explore the history and culture, resources, and traditional land management of the area through tours led by Tribal members. Additionally, there would be opportunities for visitors to see and purchase Oglala arts and crafts. Audio tours might be available. Bilingual (English and Lakota) signs would be used on roads, in interpretive displays, and elsewhere.
- Historic and cultural discovery would occur at activities such as powwows and ceremonies. At some cultural or ceremonial sites, as well as at campgrounds, interpretive activities would be presented so visitors could learn more about the Lakota culture and history. Programs would feature Tribal members who wear and explain traditional dress, and story-telling and oral history would be presented by Tribal elders.
- Within this zone, visitors would experience a highly controlled environment, with opportunities to access and view an active research quarry. Development would be

temporary and done to support paleontological research and provide for visitor health and safety. Visitors would have the opportunity to gain understanding about the value of research and the process of caring for paleontological resources.

- Interpretive signs would be placed along roads to identify locations, animals and plants, historic locations, and mileages.
- Interpretation and orientation information would also be available at the LHEC.

Visitor Access and Enjoyment

Alternative D envisions a visitor contact station at White River. Another visitor contact station would be constructed on the west side along the perimeter, where practicable. Staff housing at the White River Visitor Center would be expanded and improved to accommodate the increase in staff. One, possibly two, entrance stations would be developed.

The LHEC would include a museum for artifacts, fossil resources, and natural history specimens. Development of the LHEC would continue as funding permits. For more details concerning the LHEC, refer to the “Elements Common to All Action Alternatives” section in this chapter.

Recreational opportunities would be available through guided hikes, and unpaved hiking trails and campsites would be established along the perimeter of the South Unit. Hiking would be allowed on some primitive trails in the Natural Area / Recreation Zone. Some developed campsites would be available around the perimeter. Backcountry camping would be allowed in designated interior areas by permit. Park management would institute a permit and reservation system for unguided access into the interior; guided access would also be allowed.

Along the perimeter of the park, there would be arts and crafts outlets, powwow grounds, modern equestrian grounds, and visitor amenities accessible by vehicle. Visitors could explore the South Unit at dispersed visitor

access points along the perimeter. These visitor access points would have trails, trailheads, parking areas, rest areas with comfort stations, overlooks, and wayside exhibits. In other areas visitors could access the perimeter where there is less development. There would be an improved road to the quarry area (Research Zone), which would feature parking, restrooms, trailheads, and campsites. Two-track unimproved roads in the interior would be used for administrative access only. The interior would not have visitor facilities, and there would not be any improved or maintained roads for visitor use other than the road to the quarry.

Guided trail tours would take visitors to select areas in the interior. Where bike lanes could be safely provided, bicycling along the roads in developed zones would be encouraged.

Unguided access to ceremonial and other cultural sites of the South Unit may be restricted at certain times; interpretation of these areas would be provided primarily by guides. There would be off-site interpretation of cultural and sacred sites. Pristine areas would be set aside for limited access through guided tours only. Visitor participation at scientific activity sites, such as paleontological digs, would be controlled.

A backcountry ranger patrol station with equine facilities would be developed in the interior, most likely on the west side.

To limit the impacts on the natural environment, development and visitor activities would be restricted mostly to the perimeter of the South Unit. The existing two-track roads would continue to provide access to the South Unit and would be improved along the perimeter as needed to provide access to the amenities there. Minimal development would accommodate primitive camping in the Natural Area / Recreation Zone.

Staffing and Cost

Full staffing levels under this alternative would be 26 FTEs at a cost of approximately \$1.8 million per year. The total number of staff needed for this alternative would be an increase of 24 positions over the current staffing level.

The management divisions and staffing needs for each are as follows:

Volunteers, a key component of a park manager's ability to protect resources and provide high quality visitor services, would be encouraged. If funding and staffing for some elements of this alternative were substantially reduced or should become unavailable from federal sources, park managers would consider other options, such as expanding the park volunteer program or developing partnerships with other agencies, organizations, businesses, and/or the OST, to accomplish these elements.

One-time facility needs and costs for this alternative are estimated at approximately \$21.8 million. Refer to appendix D for a comparison of one-time facility costs related to each alternative.

This cost includes actions for the preservation and interpretation of cultural and natural resources not related to facilities. These are costs that would require substantial funding over and above park annual operating cost. Based on the goals and needs identified in the resource management section of this document, the plans and supporting surveys identified for alternative B above are the same under this alternative; therefore, the total non-facility cost would be \$4.7 million.

ELEMENTS COMMON TO ALL ALTERNATIVES

The following summary describes the single element that would be common to all alternatives.

Facilities and Development

Regardless of the alternative selected, the LHEC would be built whenever funding becomes available. Development of the LHEC would continue as funding permits. A museum with curatorial facilities to house, display, and protect fossils and artifacts would be a component of the LHEC. Those elements of the alternatives applicable to the LHEC would be implemented once the facility is fully operational. Because the construction of the LHEC is Congressionally

authorized, but not funded, based on Public Law 90-463, the requirement applies to all alternatives, including the No-Action Alternative.

Boundary Adjustments

No boundary adjustments are contemplated in any of the alternatives.

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES

The following summary describes elements that are common to all action alternatives.

Resource Management

Bison fencing would be provided where necessary.

Visitor Use and Experience

Guided tours that include interpretation of natural resources would be provided.

Interpretation of the Bombing Range would be provided.

Visitor Access and Enjoyment

Wells and cisterns would be provided at campgrounds.

Facilities and Development

Appropriate administrative and visitor access by horse or vehicle would be allowed on roads and two tracks as specified by management throughout the South Unit. Off-road vehicle access would only be permitted through a documented management decision process.

Depending upon the ultimate location of the LHEC, a contact station to provide orientation and information would be developed in an appropriate location on the east or west side of the South Unit. An entrance station and a contact station could be co-located. Until the LHEC is developed, the White River Visitor Center would be the primary visitor center in the park. The function of the White River Visitor Center

would change to reflect operational needs. To facilitate the collection of fees, one or more entrance stations could be developed.

Operations

An asset management program would be developed and implemented. Facilities would be identified and deficiencies would be corrected. Facilities maintenance and facilities operations would be executed.

The need for commercial services would be evaluated to determine first whether they are necessary and appropriate and then whether they represent an economically feasible operation.

The main roads in the South Unit would be improved. If congestion in the South Unit begins to approach an unacceptable level, the park would look at alternatives for resolving the issue. This could involve expanding existing facilities, constructing new ones, and exploring mass transportation systems with on-board interpretive programs.

Removal of unexploded ordnance at the Bombing Range would continue.

Patrols to protect against theft of cultural and paleontological resources would increase.

The range survey currently underway on Range Unit 505 to determine management needs would continue until complete.

MITIGATION MEASURES

The following mitigation measures would be used to avoid or minimize potential impacts on natural and cultural resources from construction activities, use by visitors, and park operations. These measures would apply to all alternatives.

Natural Resources

Air Quality

The best available clean fuel technology and exhaust equipment would be applied (as it becomes available) to construction equipment to the extent feasible.

A dust abatement program would be used, including watering or otherwise stabilizing soils, covering haul trucks, employing speed limits on unpaved roads, minimizing vegetation clearing, and promptly revegetating after the completion of construction.

Water Quality

Best management practices such as the use of silt fences would be followed to ensure that construction-related effects were minimal and to prevent long-term impacts on water quality, wetlands, and aquatic species.

The park's spill prevention and pollution program for hazardous materials would be used and would be updated on a regular basis. Standard measures could include storage and handling procedures for hazardous materials; containment, cleanup, and reporting procedures for spills; and limiting refueling and other hazardous activities to upland/nonsensitive sites.

Any new facilities would be built to avoid water resources, including wetlands, drainages, and riparian areas. Any new structures would be placed outside of floodplains.

Soils and Vegetation

Roadside mowing would be timed to help prevent the spread of noxious weeds.

Efforts to prevent soil loss would be undertaken, as appropriate, for all excavation, grading, construction, and other soil disturbing activities. These actions could include the following:

- Covering or seeding disturbed areas.
- Imposing speed limits for construction vehicles in unpaved areas.
- Covering trucks hauling dirt and debris.
- Salvaging and reusing native soils.

Work on campsites, roads, and other facilities in and outside the park would continue to be planned to reduce impacts on vegetation. Site-specific surveys would identify areas to be avoided because of terrain or resource concerns. Proposed locations for picnic sites or campsites would be surveyed for possible special-status plant species, and such sites would be designed

and maintained to discourage the development of social trails.

Revegetation plans would be developed for areas affected by major construction activities. The use of native plant species would continue to be required, as would the salvage of plants and topsoils. Revegetation plans would continue to specify such features as seed and plant sources, seed mixes, soil preparation, fertilizers, and mulching. As much as possible, salvaged vegetation would be used rather than new planting or seeding.

To maintain genetic integrity, an attempt would be made to restore vegetation by using seed of native genotypes collected in the Northern Great Plains. Consideration would be given to using plant material propagated from seeds or plant stock collected in the project area. The use of nonnative species or genetic materials would be considered only where deemed necessary to maintain a cultural landscape or to prevent severe resource damage. Any such use would be approved by the park's resource management personnel.

Restoration activities would be instituted immediately after construction was completed. Monitoring would be carried out to ensure that revegetation would be successful, plantings would be maintained, and unsuccessful plant materials would be replaced.

Wildlife

To the extent possible, new or rehabilitated facilities would be sited to avoid sensitive wildlife habitats such as major wildlife travel areas or corridors, feeding and resting areas, or nesting areas.

Construction activities would be timed to avoid sensitive periods such as nesting or calving seasons. Ongoing use by visitors or park operations could be restricted if their potential to cause damage or disturbance warranted doing so.

Measures would be taken to reduce the potential for wildlife to obtain food from humans. The park would continue to educate visitors about the need to refrain from feeding wildlife. Signs with this information would be attached to

picnic tables and posted on kiosks in campgrounds and picnic areas.

Special-status Species

Park staff would conduct surveys for special-status species before taking any action that might cause harm. In consultation with the U.S. Fish and Wildlife Service and the state of South Dakota, the NPS would take measures to protect any sensitive species, whether they were identified through surveys or presumed to be present.

Paleontological Resources

All ground-disturbing undertakings would be assessed for the presence of paleontological resources, and surveys would be conducted before the selected alternative was implemented. During construction in areas considered to have potential for undisturbed resources, monitoring would be conducted to ensure that sites would be avoided and to evaluate uncovered resources. If paleontological resources were identified and could not be avoided by project redesign, data recovery excavations would be completed before construction.

If unknown paleontological resources were discovered during construction, work in that location would be stopped until the resources were properly recorded and evaluated. Measures would be taken to avoid further resource impacts or to mitigate their loss or disturbance.

Because of the continued loss of resources from illegal collecting, park management would increase its efforts to protect fossil resources. These efforts would include increased emphasis on interpretive messages about the fossils and more signs advising visitors that fossil collecting is illegal. It is expected that these efforts would reduce illegal collection by park visitors. In addition, NPS law enforcement efforts would be increased to reduce poaching of fossils for commercial interests.

Cultural Resources

In consultation with the Tribal Historic Preservation Officer, Tribal officials, the Advisory Council on Historic Preservation, and other interested parties, under all the alternatives

the park staff would continue to apply the following measures to avoid or minimize impacts on historic properties, archeological resources, and ethnographic resources.

All ground-disturbing undertakings would be assessed for the presence of archeological resources, and intensive ground surveys would precede any and all ground-disturbing activities. To ensure that sites would be avoided and to evaluate undiscovered resources, archeological monitoring would be continued during construction in areas considered to have potential for undisturbed resources. If archeological resources were identified and could not be avoided by project redesign, mitigation measures developed in consultation with the Tribal Historic Preservation Office would be completed before construction.

In compliance with the statute and all regulations of the *Native American Graves Protection and Repatriation Act* of 1990, and following the provisions specified in the regulations, the park superintendent would notify all potentially culturally affiliated Tribes upon the discovery of American Indian human remains, funerary objects, sacred objects, or objects of cultural patrimony. The park manager would consult with the federally recognized Tribes that are potentially affiliated, either through the Tribal governments or their duly designated representatives. All decisions regarding the disposition and/or treatment of American Indian human remains, funerary objects, sacred objects, or objects of cultural patrimony would be made in full compliance with the *Native American Graves Protection and Repatriation Act* statute and regulations.

Park management would consult Tribal officials before taking actions that could affect ethnographic resources. Park management would abide by existing cooperative agreements and would pursue additional agreements with culturally affiliated Tribes to avoid resource impacts, allow access for traditional gatherings and other approved activities, and minimize potential use conflicts in culturally sensitive areas. The park would develop and accomplish its programs in a manner respectful of the

beliefs, traditions, and other cultural values of the OST.

Other possible mitigation measures would be developed and implemented as necessary in

consultation with the Tribal Historic Preservation Office, the Advisory Council on Historic Preservation, Tribal officials, and other interested parties.

ALTERNATIVES CONSIDERED BUT DISMISSED

In February 2010, prior to the identification of a preferred alternative, a value-analysis decision-making process, “Choosing by Advantages” (CBA), was undertaken. An interdisciplinary team debated and considered the advantages of each alternative, public input, probable environmental consequences, and costs of the alternatives. The CBA process led to the development of the Preferred Alternative. As a result of developing the preferred alternative through the CBA process, alternative D was

modified to incorporate the advantages from each of the other alternatives. The other alternatives were changed slightly to capture the full breadth of ideas brought to the preliminary alternatives by the public.

The development of alternative transportation into and out of the South Unit was discussed throughout the planning process. Given the existing state of development and management, it was decided that planning for alternative transportation would be premature at this time.

THE ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The NPS is required to identify the environmentally preferable alternative in its environmental impact analysis documents for public review and comment. The NPS, in accordance with the Department of the Interior policies contained in the *Department Manual* (516 DM 4.10) and the *Council on Environmental Quality's Forty Questions*, defines the environmentally preferable alternative (or alternatives) as the alternative that best promotes the national environmental policy expressed in the *National Environmental Policy Act* (NEPA) (Section 101(b)).

Section 101 states that it is the continuing responsibility of the federal government to

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. Ensure safe, healthful, productive, and esthetically and culturally pleasing surroundings for all Americans;
3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4. Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and a variety of individual choices;
5. Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

A description of how each alternative would or would not achieve the requirements of sections 101 and 102(1) of NEPA is shown in table 3.

The No-Action Alternative (alternative A) represents the status quo, or current management. Alternative A partially meets criterion 1 in that the South Unit is managed as a relatively large, remote natural area. However, management of the site to protect natural and cultural resources is occurring on an as-needed basis rather than providing active management of the area (criterion 4). Alternative A does not provide the range of diversity and individual choices for visitor experience and/or natural and cultural resources management that the action alternatives do (criterion 3). It does not provide for safe, healthful, productive, and aesthetically and culturally pleasing surroundings to the degree the action alternatives do (criterion 2). Alternative A does not fully meet criteria 3, 4, and 5 to the same extent as the action alternatives because it has fewer recreational opportunities and does not afford the same level of active resource and visitor use management.

Alternative B proposes managing the majority of the South Unit as Natural Area / Recreation Zone, with a designated Development Zone on the perimeter and a Research Zone surrounding an active paleontological quarry. Alternative B provides recreational opportunities, preservation of resources, and active resource management, fully meeting criteria 1, 2, and 3. However, alternative B does not afford the same focus on the cultural resources of the South Unit, specifically the heritage and culture of the Lakota. Therefore, alternative B only partially meets criteria 4 and 5.

Alternative C realizes criterion 1, designating a majority of the park as Preservation Zone and discouraging visitor access to the interior of the South Unit, thus providing limited new recreational opportunities, while still promoting expanded opportunities for visitors to experience Lakota culture and history. Therefore, alternative C fully meets criteria 1, 2, and 4 and partially meets criteria 3 and 5.

TABLE 3. COMPARISON OF ALTERNATIVES REGARDING NEPA CRITERIA

Criterion	Alternative A (No Action)	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations	Partially meets criterion	Fully meets criterion	Fully meets criterion	Fully meets criterion
Ensure safe, healthful, productive, and aesthetically and culturally pleasing surroundings for all Americans	Partially meets criterion	Fully meets criterion	Fully meets criterion	Fully meets criterion
Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences	Does not meet criterion	Fully meets criterion	Partially meets criterion	Fully meets criterion
Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and a variety of individual choices	Partially meets criterion	Partially meets criterion	Fully meets criterion	Fully meets criterion
Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities	Does not meet criterion	Partially meets criterion	Partially meets criterion	Fully meets criterion
Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources	Meets criterion	Meets criterion	Meets criterion	Meets criterion
Conclusion:				Environmentally preferable alternative

Alternative D, the preferred alternative, proposes managing the South Unit as Natural Area / Recreation Zone, with a designated Development Zone on the perimeter and a Research Zone surrounding an active paleontological quarry (like alternative B). Also like alternative B, alternative D provides recreational opportunities, preservation of resources, and active resource management and

thus fully meets criteria 1, 2, and 3. Alternative D also focuses on the cultural resources of the South Unit, specifically the heritage and culture of the Lakota, providing for preservation of both the natural and historic resources of the South Unit, fully meeting criteria 4 and 5. Therefore, alternative D is the environmentally preferable alternative.

SELECTING THE PREFERRED ALTERNATIVE

The development of the preferred alternative involved evaluating the alternatives through the use of an objective analysis process called CBA. Through this process, the team identified and compared the relative advantage of each alternative according to a set of factors. The benefits or advantages of each alternative are compared for each of the following CBA factors:

- Prevent loss, maintain, and improve conditions of natural and cultural resources.
- Preserve Oglala Sioux tribal resources, traditions, culture, and heritage.
- Direct resource interpretation and education to improve visitor experience.

Each alternative was rated based on a scoring system that evaluated how well each alternative achieved the purpose of each factors identified above. After selecting the preferred alternative, the team also evaluated the preferred alternative based on the following factors:

- Were the needs and preferences of the public and stakeholders considered?

- How well did the preferred alternative answer the issues identified during scoping?
- Is the preferred alternative cost conscious and how would the park save budgeted funds?
- Would adding or revising attributes or high-cost items strengthen the preferred alternative?
- Is the preferred alternative consistent with the park's purpose and significance?
- Should the importance values be adjusted?

The final outcome of the CBA process concluded that the alternative selected as the preferred alternative (alternative D) would give the NPS and the OST the greatest overall benefits for each point listed above for the most reasonable cost. A comparison of alternatives is shown in table 4, and environmental consequences are compared in table 5.

TABLE 4. COMPARISON OF ALTERNATIVES

Management Elements	Alternative A: No Action (Continue Current Management)	Alternative B: Expand Interpretive Opportunities	Alternative C: Focus on Resource Protection/Preservation	Alternative D: Protect Resources while Expanding Interpretive Experience (Preferred Alternative)
Concept				
	Current management would continue. Operations, visitor opportunities, and resources would continue as currently managed. MANAGEMENT ZONES: None.	Restoration programs would be developed with the goal of managing natural conditions in areas not grazed. Native species would be reintroduced in some areas. Natural resource management would focus on surveys and research. Cultural resource management would focus on protection and preservation of historical, spiritual, and ceremonial sites. Interpretive programs focused on Oglala Sioux history and culture would be provided. Cultural and natural resource self-guided and other discovery tours in the interior and on the perimeter of the South Unit would be provided for. MANAGEMENT ZONES: Natural Area / Recreation Zone, Research Zone (quarry), Development Zone along perimeter. Management would focus on restoration with expanded access and opportunities for visitors. Opportunities would include interpretation of natural, cultural, and paleontological resources.	Restoration programs would be developed with the goal of restoring natural, pre-expansion conditions, expanding into Range Unit 505. Livestock would be gradually eliminated and native species reintroduced. Natural resource management would focus on preservation and restoration. Cultural resource management would focus on protection and preservation of historical, spiritual, and ceremonial sites. Focus would be on providing a range of appropriate visitor uses on the perimeter of the South Unit. MANAGEMENT ZONES: Natural Area / Recreation Zone, Preservation Zone, Development Zone. Management would focus on preservation, protection, and restoration of natural and cultural resources. Access would be limited primarily to the perimeter.	Restoration programs would be developed with the goal of managing and restoring natural, pre-expansion conditions in areas not grazed, using indigenous stewardship methods and models. Natural resource management would focus on surveys and research. Cultural resource management would focus on protection and preservation of historical, spiritual, and ceremonial sites. Interpretive programs focused on Oglala Sioux history and culture would be provided. Cultural and natural resource guided tours in the interior and self-guided tours on the perimeter of the South Unit would be provided for. MANAGEMENT ZONES: Natural Area / Recreation Zone, Research Zone (quarry), Development Zone. Management would focus on restoration with expanded access and opportunities for visitors. Opportunities would include interpretation of natural, cultural, and paleontological resources.
Biological Resources Management Elements				
Vegetation management	No active management; restoration programs initiated as necessary.	Exotic plant species would be managed using integrated weed management strategies; disturbed sites would be revegetated with native plants.	Same as alternative B, plus would actively seek to reintroduce and/or enhance native and culturally significant plant populations and inventory and protect rare, medicinal, and edible plants.	Same as alternative C.
Wildlife management—bison	No bison reintroductions.	Bison would be reintroduced in some areas as the opportunity arises, <i>dependent on existing leases</i> (specific areas to be identified by NPS/OST concurrently with leases).	Bison would be reintroduced in Range Unit 505 and a preserve/reserve would be created. Additional reintroductions would occur as the opportunity arises, <i>dependent on existing leases</i> .	Same as alternative C.
Wildlife management—livestock	Livestock grazing would continue; grazing leases would remain in effect.	Livestock grazing would be managed to ensure sustainability of native vegetation and gradually eliminated from Range Unit 505.	Livestock grazing would be managed to ensure sustainability of native vegetation and gradually eliminated from South Unit.	Same as alternative C.
Restoration programs	No active restoration programs; restoration programs initiated as necessary.	Restoration programs would be developed with the goal of restoring natural, pre-expansion conditions in areas not grazed, using indigenous stewardship methods and models.	Restoration programs would be developed with the goal of restoring natural, pre-expansion conditions, expanding into Range Unit 505.	Same as alternative B.
Cultural Resources Management Elements				
Interpretation—Oglala Lakota, language, history, and culture	Limited interpretation at White River Visitor Center of Oglala Sioux history and culture would be continued. No programs would explicitly emphasize Oglala Lakota language.	Interpretive programs focused on Oglala Sioux history and culture would be provided; a living history village, where Tribal members would recount their family history and Oglala Sioux history, would be developed. Cultural and natural resource self-guided and other discovery tours would be provided for.	Interpretive programs focused on Oglala Sioux history and culture would be provided; a living history village, where Tribal members would recount their family history and Oglala Sioux history, would be developed. An emphasis on preservation of Lakota language and culture would be developed through a variety of education and interpretation programs.	Same as alternative C.

TABLE 4. COMPARISON OF ALTERNATIVES

Management Elements	Alternative A: No Action (Continue Current Management)	Alternative B: Expand Interpretive Opportunities	Alternative C: Focus on Resource Protection/Preservation	Alternative D: Protect Resources while Expanding Interpretive Experience (Preferred Alternative)
Paleontological Resources Management Elements				
Quarries	No operating quarries in South Unit.	One active quarry would be opened for visitor viewing; paleontology digs would be monitored by trained park personnel, consistent with Tribal policies.	Same as alternative A.	Same as alternative B.
Collection storage	Fossil collections would continue to be housed in off-site repositories, such as the South Dakota School of Mines and Technology.	Existing fossil collection would continue to be housed in off-site repositories, such as the South Dakota School of Mines and Technology; fossils collected from quarry operation and surveys would be prepared and curated by trained park personnel and housed off site until the LHEC museum is fully operational.	When feasible, existing known fossil collections acquired from the South Unit would be located, returned, and housed at the LHEC museum, once operational. Fossils collected from quarry operation and surveys would be prepared and curated by trained park personnel and housed off site until the LHEC museum is fully operational.	Known fossil collections would be identified and additional collections would be investigated, and, where feasible, returned and housed at the LHEC museum, once operational. Fossils collected from quarry operation and surveys would be prepared and curated by trained park personnel and housed off site until the LHEC museum is fully operational.
Visitor Use and Experience Management Elements				
Interpretation—cultural/ceremonial sites	No interpretation of cultural or ceremonial sites.	Interpretive opportunities would be provided at some cultural and ceremonial sites. Visitation/access at sacred and/or ceremonial sites would be controlled.	Interpretive opportunities of cultural and ceremonial sites would be provided at the LHEC, once fully operational.	Same as alternative C.
Interpretation—exhibits/visitor contact	No change in the number of exhibits or interpretive staff at the White River Visitor Center would occur; no additional visitor center/contact stations would be developed in South Unit.	White River Visitor Center exhibits would be improved and possibly expanded; additional visitor contact center (location to be determined) would be developed.	White River Visitor Center exhibits would be improved and exhibits providing biological and ecological interpretation and exhibits about Oglala Sioux history and culture developed.	Same as alternative B.
Visitor Access and Enjoyment Elements				
Visitor access	No restrictions on visitor access. Guides would not be available. Fences on leased lands would remain in place.	Visitor access in cultural, sacred, and ceremonial sites would be controlled.	Visitor access would be limited to certain areas of the interior of South Unit.	Same as alternative B.
Interior	Access to interior would continue via paths or two-track unimproved roads.	Visitor access in interior would be limited to an improved road to quarry area with parking, restrooms, trailheads, and campsites (added at quarry) and guided tours.	Visitor access in interior would be limited to guided tours and primitive camping/hiking. No improved road.	Visitor access to interior would be limited to an improved road to quarry area with parking, restrooms, trailheads, and campsites (added at quarry). Administrative access to interior would be allowed on two-track, unimproved roads.
Perimeter	Access around perimeter would continue via existing two-track unimproved roads	Developed perimeter access would be focused in one location (White River Visitor Center); facilities would include parking, restrooms, trailheads, and overlooks. Dispersed visitor access points would be developed.	Developed perimeter access would be concentrated in one location (Natural Area / Recreation Zone); facilities would include parking, restrooms, trailheads, and overlooks.	Developed perimeter access would be concentrated in one location (Development Zone); facilities would include parking, restrooms, trailheads, and overlooks.
Trails	No designated hiking or riding trails would be provided.	Hiking and horseback-riding trails would be developed along perimeter and into interior.	Unpaved hiking and horseback riding trails would be developed in the Natural Area / Recreation Zone.	Unpaved hiking and horseback riding trails would be developed in some areas in the interior.
Backcountry access	Backcountry access would not be regulated; no guide services and no interpretation would be available in the interior.	Backcountry access would be provided via developed trails, with Oglala guides to interpret history of area, Oglala culture, resources, traditional Lakota land management, etc.	Backcountry access would be restricted; no developed trails would be provided; some guided tours to select areas in the interior would be available.	Backcountry access would be provided via developed trails for hiking, riding, and backpacking; some guided tours to select areas in the interior would be available.
Camping—primitive	No primitive campsites and no backcountry camping opportunities would be available.	Unguided primitive camping for individuals and limited overnight backpacking would be provided.	Unguided primitive camping would be provided in designated areas on the perimeter, and by permit in the interior.	Unguided primitive camping for individuals and limited overnight backpacking would be provided by permit.
Camping—developed	No developed campsites currently exist.	Developed camping area(s) with amenities would be provided on the perimeter and on guided camping trips.	Same as alternative A.	Same as alternative B.
Wayside exhibits	No wayside exhibits available.	Wayside exhibits would be provided focused in one location, and dispersed along the perimeter.	Wayside exhibits would be provided in three areas (White River Visitor Center, contact station, and perimeter).	Wayside exhibits would be provided at multiple sites along the perimeter.

TABLE 4. COMPARISON OF ALTERNATIVES

Management Elements	Alternative A: No Action (Continue Current Management)	Alternative B: Expand Interpretive Opportunities	Alternative C: Focus on Resource Protection/Preservation	Alternative D: Protect Resources while Expanding Interpretive Experience (Preferred Alternative)
Facilities and Development Management Elements				
Visitor contact stations	Existing operations would continue and visitor facilities would remain concentrated at White River.	Entrance station and visitor contact stations (locations to be determined) would be developed within the Development Zone in the White River / Rocky Ford area and along most of the southern and western edge of the South Unit.	Entrance station would be developed in the Development Zone on east side in White River/Rocky Ford area; the White River Visitor Center would be expanded to hold more exhibits and accommodate increased staff; maintenance facility would be developed.	Two entrance stations (west and north side of Unit) would be developed; the White River Visitor Center would be redeveloped as a visitor contact station (until the LHEC is available); one new contact station would be developed.
Interior roads	No improved interior roads.	Existing road to quarry would be improved.	Same as alternative A.	Same as alternative B.
Operations Elements				
Staffing	Staff levels would remain at two seasonal Tribal members or law enforcement; two law enforcement rangers; one full-time park staff member in park housing anticipated; vacancies will be filled as funding permits. 2 FTEs; annual cost = \$183,000	Interpretive and museum staff, law enforcement staff, and maintenance staff would increase. 25 FTEs; annual cost = \$1.7 million	21 FTEs; annual cost = \$1.6 million	26 FTEs; annual cost = \$1.8 million

TABLE 5. COMPARISON OF ENVIRONMENTAL CONSEQUENCES

Impact Topic	Alternative A: No Action (Continue Current Management)	Alternative B: Expand Interpretive Opportunities	Alternative C: Focus on Resource Protection/Preservation	Alternative D: Protect Resources while Expanding Interpretive Experience (Preferred Alternative)
Vegetation	Alternative A would have minor to moderate long-term adverse effects on vegetation due to grazing and visitor activities. The impacts of other past, present, and anticipated projects combined with alternative A would likely result in long-term negligible to moderate adverse impacts to vegetation. There would be no impairment of vegetation from implementation of the No-Action Alternative.	Alternative B would have short- to long-term negligible to moderate adverse effects on vegetation associated with the development or improvement facilities and visitor services. The impacts of other past, present, and anticipated projects combined with alternative B would likely result in long-term minor adverse impacts to vegetation. However, the actions under alternative B would add a minimal increment to this cumulative impact. There would be no impairment of vegetation from implementation of alternative B.	Alternative C would have short- to long-term adverse and beneficial effects on vegetation resulting in negligible to moderate adverse effects on vegetation associated with the development or improvement facilities and visitor services. The impacts of other past, present, and anticipated projects combined with alternative C would likely result in long-term cumulative minor adverse effects on the park's vegetation. However, the actions under alternative C would add a minimal increment to this cumulative impact. There would be no impairment of vegetation from implementation of alternative C.	Same as alternative C.
Wildlife	Negligible to minor short-term adverse effects on wildlife populations would continue under alternative A in local areas from the presence of visitors and staff. Minor long-term adverse cumulative effects would be expected on wildlife populations at the South Unit. There would be no impairment of wildlife from implementation of alternative A.	Alternative B would have short and long-term minor to moderate adverse impacts on wildlife, as well as short and long-term beneficial impacts. The impacts of other past, present, and anticipated projects combined with alternative B would likely result in long-term minor adverse impacts. There would be no impairment of wildlife from implementation of alternative B.	Same as alternative B.	Same as alternative B.
Paleontological Resources	Alternative A would have the potential to result in continued moderate long-term adverse effects on paleontological resources. This would be caused primarily by the continued illegal removal of fossils from the South Unit by visitors and collectors, continued livestock trampling of fossils, and continued weathering and mass wasting (landslides). Added to this, other actions in and outside of the park could result in a long-term cumulative moderate beneficial impact. Most impacts to fossil resources outside of the South Unit are being addressed and mitigated through actions such as law enforcement, inventory of planned projects, and collection for study and preservation. Long-term moderate adverse effects would be anticipated on paleontological resources under alternative A. Despite the loss of some fossil resources, the NPS would not be prevented from fulfilling the purposes for which Badlands National Park was established. The loss of resources would not destroy the integrity of the park relative to paleontological resources— fossils would continue to be present throughout the park, and the park staff would continue to protect paleontological resources. People still could come to the South Unit and enjoy its values, including its fossils. There would be no impairment of paleontological resources from implementation of alternative A.	Alternative B would have the potential to result in beneficial effects on paleontological resources. This would be caused primarily by an expected reduction in illegal removal of fossils from the South Unit by visitors and collectors. Continued livestock trampling of fossils and continued weathering and mass wasting (landslides) would have an adverse impact; however, these impacts could be mitigated by continuing efforts to educate visitors about fossils, efforts to allocate existing law enforcement resources toward fossil protection, and inventories to locate and salvage fossils. The effects on paleontological resources under alternative B are anticipated to be beneficial. Illegal fossil collecting should decrease from increased law enforcement, public education, and increased inventory. Any loss of fossils would not destroy the integrity of the park relative to paleontological resources — fossils would continue to be present throughout the park, and the park staff would continue to protect, interpret, and provide opportunities for scientific research on paleontological resources. People could come to the South Unit and enjoy its values, including its fossils. There would be no impairment of paleontological resources from implementation of alternative B.	Alternative C would have potential beneficial effects on paleontological resources. This would be caused primarily by an expected reduction in illegal removal of fossils from the South Unit by visitors and collectors and reduced livestock trampling of fossils. However, the reintroduction of bison could have an adverse impact through increased trampling of fossils. Impacts could be mitigated by continuing efforts to educate visitors about fossils, efforts to allocate existing law enforcement resources toward fossil protection, inventories to locate and protect fossils, and availability of professional personnel. Added to this, other actions in and outside of the park could result in a cumulative beneficial impact. Most impacts to fossil resources outside of the South Unit are being addressed and mitigated through actions such as law enforcement, inventory of planned projects, and collection for study and preservation. The effects on paleontological resources under alternative C are anticipated to be beneficial. Illegal fossil collecting should decrease from increased law enforcement, and increased inventory. Any loss of fossils, reduced from current levels would not destroy the integrity of the park relative to paleontological resources— fossils would continue to be present throughout the park, and the park staff would continue to protect, interpret, and provide opportunities for scientific research on paleontological resources. People still could come to the South Unit and enjoy its values, including its fossils. There would be no impairment of paleontological resources from implementation of alternative C.	Alternative D would produce beneficial effects on paleontological resources. There would be an expected reduction in illegal removal of fossils from the South Unit by visitors and collectors, reduced livestock trampling of fossils, and continued weathering and mass wasting (landslides). These impacts could be mitigated by continuing efforts to educate visitors about fossils, efforts to allocate existing law enforcement resources towards fossil protection, inventories to locate and protect fossils, and availability of professional personnel. Added to this, other actions in and outside of the park could result in a long-term cumulative moderate beneficial impact. Most impacts to fossil resources outside of the South Unit are being addressed and mitigated through actions such as law enforcement, inventory of planned projects, and collection for study and preservation. The effects on paleontological resources under alternative D are anticipated to have a major beneficial effect. Illegal fossil collecting should decrease from increased law enforcement, and increased inventory. Any loss of fossils, reduced from current levels, not destroy the integrity of the park relative to paleontological resources— fossils would continue to be present throughout the park, and the park staff would continue to protect, interpret, and provide opportunities for scientific research on paleontological resources. People still could come to the South Unit and enjoy its values, including its fossils. The interpretive focus would be on the Lakota oral history view of these important resources. There would be no impairment of paleontological resources from implementation of alternative D.

TABLE 5. COMPARISON OF ENVIRONMENTAL CONSEQUENCES

Impact Topic	Alternative A: No Action (Continue Current Management)	Alternative B: Expand Interpretive Opportunities	Alternative C: Focus on Resource Protection/Preservation	Alternative D: Protect Resources while Expanding Interpretive Experience (Preferred Alternative)
Soundscapes	<p>Most of the South Unit would continue to be relatively quiet under alternative A. However, there would continue to be long-term negligible to minor adverse effects on the park's soundscape in local areas, largely from visitation and administrative activities under developed areas. Noise from activities in alternative A added to noise from other actions within and outside the South Unit could result in short-and long-term, negligible to minor adverse cumulative effects in local areas. These effects would not be sufficient to constitute an impairment of park resources or values.</p>	<p>Due to construction activities proposed under alternative B, the soundscapes within the South Unit would likely change substantially in the short-term. However, in areas not identified as areas for future construction, there would continue to be long-term negligible to minor adverse effects on the park's soundscape in local areas, largely from visitation and administrative activities in developed areas. Noise from activities under alternative B added to noise from other actions within and outside the South Unit could result in short-and long-term, minor to moderate adverse cumulative effects in local areas. These effects would not be sufficient to constitute an impairment of park resources or values.</p>	<p>Same as alternative B.</p>	<p>Same as alternative B.</p>
Archeological Sites	<p>Alternative A would have the potential to result in continued minor to moderate short to long-term adverse effects on archeological resources. This would be caused primarily by the continued illegal removal of cultural resources from the South Unit by visitors and collectors, continued livestock trampling, and continued weathering and mass wasting (landslides). These impacts could be mitigated by continuing efforts to educate visitors about archeological sites and efforts to allocate existing law enforcement resources towards fossil protection. Added to this, other actions in and outside of the park could result in a cumulative beneficial impact. Most impacts to cultural resources outside of the South Unit are being addressed and mitigated through actions such as law enforcement, inventory of planned projects, and collection for study and preservation.</p> <p>The effects on archeological resources under alternative A are anticipated to be moderately adverse; however, this would not constitute an impairment of park resources or values. For Section 106 purposes, the determination would be <i>adverse effect</i>.</p> <p>There would be no impairment of archeological resources from implementation of alternative A.</p>	<p>Alternative B would have the potential to result in beneficial effects on archeological resources within the South Unit. This would be caused primarily by the reduced illegal removal of archeological resources from the South Unit by visitors and collectors and increases in public education opportunities and inventories. The increased knowledge about the resource base would improve the ability of the park to manage the resources, as well as improve project planning and decision making. Impacts related to continued livestock trampling and continued weathering and mass wasting (landslides) would be long-term and moderate. Increased inventory would result in beneficial effects. For Section 106 purposes, this would constitute an adverse effect.</p> <p>Other actions in and outside of the South Unit could result in an overall, cumulative beneficial impact. Most impacts to cultural resources outside of the South Unit are being addressed and mitigated through actions such as law enforcement, inventory of planned projects, and collection for study and preservation.</p> <p>There would be no impairment of archeological resources from implementation of alternative B as compared to the current situation.</p>	<p>Alternative C would result in beneficial effects on archeological resources. This would be caused primarily by an expected reduction in illegal removal of archeological materials from the South Unit by visitors and collectors and reduced livestock trampling. Impacts related to continued weathering and mass wasting could be mitigated by continuing efforts to educate visitors about archeological resources, efforts to allocate existing law enforcement resources towards resource protection, and inventories to locate and protect archeological sites. Added to this, other actions in and outside of the park could result in a beneficial impact. Most impacts to archeological resources outside of the South Unit would generally be addressed and mitigated through actions such as law enforcement, inventory of planned projects, and collection for study and preservation.</p> <p>The effects on archeological resources under alternative C are anticipated to be beneficial. Illegal collecting should decrease due to increased law enforcement and increased inventory. Losses of archeological materials should be reduced considerably, and increasingly limited to losses through natural processes. Park staff would continue to protect, interpret, and provide opportunities for scientific research on archeological resources. For the purposes of Section 106, the determination of effect would be <i>no adverse effect</i>.</p> <p>There would be no impairment of archeological resources from implementation of alternative C.</p>	<p>Alternative D would have the potential to result in beneficial effects on archeological resources. There would be an expected reduction in illegal removal of archeological resources from the South Unit by visitors and collectors and reduced livestock trampling. The increased knowledge about the resource base would improve the ability of the park to manage the resources, as well as improve project planning and decision making. Impacts resulting from continued weathering and mass wasting could be mitigated by continuing efforts to educate visitors, efforts to allocate existing law enforcement resources toward protection, and inventories to locate and protect archeological sites. Added to this, other actions in and outside of the park could result in a beneficial impact. Most impacts to archeological resources outside of the South Unit are being addressed and mitigated through actions such as law enforcement, inventory of planned projects, and collection for study and preservation.</p> <p>The effects on archeological resources under alternative D are anticipated to have a beneficial effect. Illegal collecting should decrease from increased law enforcement, and increased inventory. Losses of archeological materials should be reduced considerably, and increasingly limited to losses through natural processes only. Park staff would continue to protect, interpret, and provide opportunities for scientific research on archeological resources. People still could come to the South Unit and enjoy its values, including its archeology. The interpretive focus would be on the Lakota oral history view of these important resources.</p> <p>For the purposes of Section 106, there would be no adverse effects. There would be no impairment of archeological resources from implementation of alternative D.</p>

TABLE 5. COMPARISON OF ENVIRONMENTAL CONSEQUENCES

Impact Topic	Alternative A: No Action (Continue Current Management)	Alternative B: Expand Interpretive Opportunities	Alternative C: Focus on Resource Protection/Preservation	Alternative D: Protect Resources while Expanding Interpretive Experience (Preferred Alternative)
Museum Collections	Items in the collections would continue to be stored and maintained, with some facilities meeting NPS museum storage standards. There would be no long-term overall impact on the preservation and usefulness of the collections. Accessibility to the collection by researchers and the public would remain unchanged. Because there would be no major adverse effects on this resource, there would be no impairment or unacceptable impacts.	Items in the collections would continue to be stored and maintained, with some facilities meeting NPS museum storage standards. It is assumed for this study that the LHEC would be able to house known collections from the South Unit, but the volume of materials coming from private and other repositories may overcome storage facilities. There would be a long-term minor adverse impact on the overall preservation and usefulness of the collections. Accessibility to the collection by researchers and the public would be increased. Because there would be no major adverse effects on this resource, there would be no impairment or unacceptable impacts.	Items in the collections would continue to be stored and maintained, with some facilities meeting NPS museum storage standards. It is assumed for this study that the LHEC would be able to house known collections from the South Unit. There would be a long-term minor adverse impact on the overall preservation and usefulness of the collections. Accessibility to the collection by researchers and the public would be increased. Because there would be no major adverse effects on this resource, there would be no impairment or unacceptable impacts.	Same as alternative B.
Ethnographic Resources	Alternative A would have the potential to result in long-term moderate adverse impacts on ethnographic resources due to continuing current management and access. Added to this, other actions in and outside of the park could result in a beneficial impact as well as the DM&E project's potential long term moderate to major adverse effects. Most impacts to ethnographic resources outside of the South Unit are being addressed and mitigated through actions such as inventory of planned projects, Tribal consultation, documentation and preservation. For Section 106 purposes, the determination would be <i>adverse effect</i> . Because there would be no adverse impacts, the park's resources and values would not be impaired.	Alternative B would result in beneficial effects on ethnographic resources due to increased inventory and protection, and the addition of appropriate interpretation. Added to this, other actions in and outside of the park could result in a beneficial impact; and the DM&E project's potential long-term moderate to major adverse effects. Most impacts to ethnographic resources outside of the South Unit would be addressed and mitigated through actions such as inventory of planned projects, tribal consultation, documentation and preservation. For the purposes of Section 106, the determination of effect would be <i>no adverse effect</i> . Implementing alternative B would result in beneficial impacts on ethnographic resources in the South Unit. Until the completion of inventories of ethnographic resources, park managers would conduct site-specific surveys and consult as appropriate with American Indians for each development action. The park's resources and values would not be impaired.	Alternative C would have the potential to result in beneficial effects on ethnographic resources due to increased inventory and protection, and the addition of appropriate interpretation. Added to this, other actions in and outside of the park could result in a beneficial impact; and the DM&E project's potential long-term moderate to major adverse effects. Most impacts to ethnographic resources outside of the South Unit would be addressed and mitigated through actions such as inventory of planned projects, tribal consultation, documentation and preservation. For the purposes of Section 106, implementing alternative C would result in <i>no adverse effect</i> on ethnographic resources in the South Unit. Until the completion of inventories of ethnographic resources, park managers would conduct site-specific surveys and consult as appropriate with American Indians for each development action. Because there would be beneficial impacts, the park's resources and values would not be impaired.	Same as alternative C.
Scenic Resources	The No-Action Alternative would have long-term, localized, minor to major, adverse impacts on scenery, but would not affect visibility or the night sky. There would be no impairment of scenic resources and visual quality from this alternative.	Alternative B would have negligible to major, short-and long-term, localized, adverse impacts on scenery, visibility, and night sky. There would be no impairment of scenic resources and visual quality from this alternative.	Same as alternative B.	Same as alternative B.
Visitor Experience – Access	Alternative A would result in long-term minor adverse impacts to visitor access.	By improving access in the South Unit, alternative B would produce a beneficial effect on visitor access. The improvement in access would come from improvement of local roads, construction of new parking lots, guided and unguided tours to the backcountry, increased camping opportunities, and improved signage on surrounding roads.	By improving access in the South Unit, alternative C would produce a beneficial effect on visitor access. The improvement in access would come from improvement of the local roads, guided tours into the backcountry, construction of new parking lots, increased camping opportunities, the development of interior pedestrian trails, and improved signage on surrounding roads. Access into the backcountry would be limited.	By improving access in the South Unit, alternative D would produce a beneficial effect on visitor access. The improvement in access would come from the construction of two new entrance stations, improvement of the local roads, guided tours into the backcountry, construction of new parking lots, increased camping opportunities, the development of interior pedestrian trails, and improved signage on surrounding roads. Access into the backcountry would be limited, and an emphasis would be placed on educational opportunities in the backcountry and on Lakota history and culture.
Visitor Experience – Availability of Information	Alternative A, the No-Action Alternative, would result in continued adverse effects on the experience for visitors to the South Unit. The current effects on the visitor experience are minor; however, if changes in visitation patterns continue, the effects could become more severe.	Alternative B would result in beneficial effects on the availability of information about the park. The increase in the number of outlets where visitors could obtain information and the dispersed locations of these outlets would substantially improve the visitor experience.	Same as alternative B.	Same as alternative B.

TABLE 5. COMPARISON OF ENVIRONMENTAL CONSEQUENCES

Impact Topic	Alternative A: No Action (Continue Current Management)	Alternative B: Expand Interpretive Opportunities	Alternative C: Focus on Resource Protection/Preservation	Alternative D: Protect Resources while Expanding Interpretive Experience (Preferred Alternative)
Visitor Experience – Range and Enjoyment of Visitor Activity	Implementing alternative A would result in long-term negligible adverse effects on visitor range and enjoyment of activities.	There would be more opportunities throughout the park and vicinity for visitors seeking to drive/sightsee, hike, camp, and/or picnic, creating beneficial effects on such visitors.	There would be slightly more opportunities throughout the park for visitors seeking to drive/sightsee, hike, camp, and/or picnic, creating beneficial effects on such visitors.	Same as alternative C.
Socioeconomics	The socioeconomic effect of operations and visitor use at the South Unit under the No-Action Alternative would be long-term, negligible, and adverse.	The socioeconomic effect of operations and visitor use at the South Unit under alternative B would be expected to have beneficial economic impacts.	Same as alternative B.	Same as alternative B.
Park Operations	Lack of a clear plan and management zones would lessen the effectiveness of existing staff and volunteers over time. This would result in adverse long-term moderate impacts to the operation of the park.	A clear plan of action and increased staff to implement those actions would result in highly effective park operations and coordination of partners and volunteers to protect resources and serve visitors. The effect would be beneficial.	Same as alternative B.	Same as alternative B.
Unavoidable Adverse Impacts	Minor adverse impacts on natural resources would be caused by human use in some areas in the South Unit resulting from ongoing recreational use of land and facilities (e.g., soil compaction, vegetation trampling, wildlife disturbances, and decreased opportunities for solitude). Although these impacts would be unavoidable, mitigation to reduce them would be carried out where possible.	Under alternative B, the activities related to the construction of additional facilities as well as human use, would result in minor adverse impacts on natural resources in some areas of the South Unit. Although these impacts (e.g., soil compaction, vegetation trampling, wildlife disturbances, and decreased opportunities for solitude) would be unavoidable, mitigation to reduce them would be carried out where possible.	Same as alternative B.	Same as alternative B.
Irreversible and Irretrievable Commitments of Resources	With the exception of consumption of fuels and raw materials for maintenance activities, no actions in this alternative would result in consumptions of nonrenewable natural resources or use of renewable resources that would preclude other uses for a period of time.	Under alternative B, there would be a commitment of land, raw materials, and consumption of fuels associated with the construction of the new visitor and administrative facilities as described in detail in —Chapter 3: Alternatives, Including the Preferred Alternative.” These energy requirements, raw materials and land requirements to construct new facilities represent an irretrievable commitment of resources.	Same as alternative B.	Same as alternative B.
Relationship of short-term uses and long-term productivity	Under alternative A, the South Unit would continue to be managed as it is, and no management zones are prescribed. Under the No-Action Alternative, the park would maintain its long-term productivity and there would be virtually no new development or appreciable loss of long-term ecological productivity.	Short-term impacts might result from construction of new visitor and administrative facilities to resources such as local water pollution, as detailed in the analysis of specific impact topics. Noise and human activity from construction might displace some wildlife from the immediate area. However, these activities would not jeopardize the long-term productivity of the environment except in areas occupied by new facilities. Proposed actions would also yield long-term benefits from a visitor experience perspective.	Short-term impacts might result from construction of new visitor and administrative facilities to resources such as local water pollution, as detailed in the analyses of specific impact topics. Noise and human activity from construction and restoration might displace some wildlife from the immediate area. However, these activities would not jeopardize the long-term productivity of the environment except in areas occupied by new facilities.	Same as alternative C.

CHAPTER 4: Affected Environment



INTRODUCTION

This chapter describes the existing environment of the South Unit of Badlands National Park (South Unit). The focus is on elements (natural and cultural resources, visitor opportunities, socioeconomic characteristics, etc.) that would be affected by the actions proposed in the alternatives should they be implemented. These topics were selected on the basis of federal law, regulations, executive orders, National Park Service (NPS) expertise, and concerns expressed by the Oglala Sioux Tribe (OST), other

agencies, or members of the public during project scoping.

The first section in this chapter discusses impact topics that are analyzed in detail in the *South Unit General Management Plan / Environmental Impact Statement* (South Unit GMP/EIS). The next section discusses impact topics that are not analyzed in detail and explains the rationale for these decisions. Impact topics are described in table 6.

TABLE 6. IMPACT TOPICS

Impact Topics Considered in this Plan <i>Alternatives in this plan have potential to affect these resources or topics</i>	Impact Topics Eliminated from Detailed Analysis in this Plan <i>These resources or topics are important, but alternatives in this plan would have only positive impacts and/or any adverse impacts would negligible to minor.</i>
Natural Resources	Natural Resources
<i>Vegetation</i>	<i>Water Resources (quantity and quality)</i>
<i>Wildlife</i>	<i>Floodplains</i>
Paleontological Resources	<i>Special Status Species – Threatened, Endangered, or Candidate Species</i>
Soundscapes	<i>Wetlands</i>
Cultural Resources	<i>Prime and Unique Farmland</i>
<i>Archeological Sites</i>	Geologic Features and Process (including Minerals and Soils)
<i>Museum Collections</i>	Air Quality
<i>Ethnographic Resources</i>	Wilderness Values
<i>Scenic Resources</i>	Climate Change
Visitor Experience	Cultural Resources
<i>Access</i>	<i>Historic Structures</i>
<i>Availability of Information</i>	<i>Cultural Landscapes</i>
<i>Range and Enjoyment of Visitor Activity</i>	Indian Trust Resources
Socioeconomics	Natural or Depletable Resource Requirements and Conservation Potential
Park Operations	

IMPACT TOPICS CONSIDERED AND ANALYZED IN DETAIL

NATURAL RESOURCES

Vegetation

Badlands National Park is at the western edge of what was once the mixed-grass prairie ecosystem. The mixed-grass prairie of the central United States was a transition zone between the arid short-grass prairie to the west and the moist tall-grass prairie to the east. In conjunction with the adjacent Buffalo Gap National Grassland today the park supports one of the largest contiguous native mixed-grass prairies under federal protection in the United States, and it is part of one of the largest remaining mixed-grass prairies in North America (NPS 2007c).

The vegetation of the North and South Units was mapped in 1999 as part of a nationwide vegetation mapping project of the U.S. Geological Survey and the NPS (Bureau of Reclamation 1999). Based on the data, approximately 28 vegetation types were classified and ten land use/land cover types were also identified. Outside of sparsely vegetated areas, nine major vegetative communities were identified: dry mixed-grass prairie, mesic mixed-grass prairie, introduced grasslands, riparian/wet meadows, dry plains shrublands, mesic plains shrublands, riparian shrublands, dry coniferous forest and woodlands, and riparian deciduous forests and woodlands. Other minor vegetation communities include emergent wetlands and a prairie dog grassland complex.

Botanical studies have been conducted in the North and South Units. The plant inventories are estimated to be about 90 percent complete. A total of 457 vascular plant species, representing about 70 families, have been documented. About 38 more species are believed to inhabit the park but have not yet been documented. The largest number of species present is in the Asteraceae (sunflower) family (NPS 2001). There is also an inventory of lichens: a total of 171 lichen species and four species of lichenicolous fungi were recorded in the park (Will-Wolf 1998).

Little information is available on other nonvascular plants in the park.

Grasses are the dominant plants in Badlands National Park. Forty-one species of native grasses are recorded in the park. Among the most important are buffalo grass, blue grama, western wheat grass, and needle-and-thread grass. The grasses are well-adapted to environmental conditions, able to withstand high winds, long periods of dry weather, and frequent fires. They also furnish food and habitat for wildlife, add humus and fertility to the topsoil as they decay, and hold the soil from being blown or washed away.

Vegetation Communities

Grasslands

Grasslands are the dominant vegetative community in the park, covering about 55,065 acres (22,284 ha), or 40 percent of the South Unit. Many natural and anthropogenic factors have influenced the park's current grasslands, including soil type and depth, moisture levels, fires, and grazing. As a result, the park has a diverse grassland mixture that intermingles in small units across the landscape.

Mixed-grass prairie, the most common vegetative community in the park, covers about 52,200 acres (21,124 ha), or 38 percent of the South Unit. Dry mixed-grass prairies are found throughout the park. Western wheatgrass (*Pascopyrum smithii*), blue grama (*Bouteloua gracilis*), green needlegrass (*Nassella viridula*), threadleaf sedge (*Carex filifolia*), little bluestem (*Schizachyrium scoparium*), side-oats grama (*Bouteloua curtipendula*), and buffalo grass (*Buchloe dactyloides*) dominate this plant community. Other forbs and grasses are commonly present as well, including prairie coneflower (*Ratibida columnaris*), white milkwort (*Polygala alba*), and prairie dropseed (*Sporobolus heterolepis*). In wetter spots on selected hills, slopes, and buttes can be found mesic mixed-grass prairie, dominated by western wheatgrass and green needlegrass.

Riparian/wet meadows are a rare grassland community, covering less than 1 percent of the South Unit. They are found along the bottoms of drainage channels. Prairie cordgrass (*Spartina pectinata*) and pale spikerush (*Eleocharis palustris*) are two graminoids commonly found in these wet areas.

Dry Mixed-Grass Prairie. Three prairie types occur within the dry mixed-grass vegetation community in the South Unit. They are Western Wheatgrass-Blue Grama-Threadleaf Sedge Grassland, Little Bluestem-Grama Grasses-Threadleaf Sedge Grassland, and Blue Grama-Buffalo Grass Grassland. Western Wheatgrass-Blue Grama-Threadleaf Sedge Grassland occur in a variety of habitats throughout the park but generally on flat to moderately steep slopes on all aspects. Western wheatgrass is dominant in ungrazed stands but due to increased grazing in the South Unit this community is dominated by blue grama and threadleaf sedge on drier soils and Kentucky bluegrass (*Poa pratensis*) on more mesic sites. Little Bluestem-Grama Grasses-Threadleaf Sedge Grassland occurs in patches along drainageways and along the edges and at the heads of draws of variable steepness and aspect. Little bluestem is the dominant species, with lesser amounts of sideoats grama and forbs. The most extensive stands in the South Unit occur in the Palmer Creek subunit. Blue Grama-Buffalo Grass Grassland occupy drier soils on hilltops, ridges, and sandy soils that have a regular grazing regime either by livestock or prairie dogs. It contains a variable mix of grasses, dominated by blue grama and a variety of forbs (Bureau of Reclamation 1999).

Mesic Mixed-Grass Prairie. One prairie type occurs within the mesic mixed-grass vegetation community in the South Unit. It is Western Wheatgrass-Green Needlegrass Grassland. Western Wheatgrass-Green Needlegrass occurs on flats on plains and buttes and moderate hillslopes of all aspects. Dominant graminoid species vary within a stand and include western wheatgrass, green needlegrass, blue grama, and Japanese brome (*Bromus japonicus*). While stands of this community type or more commonly found in the North Unit large stands are found on Sheep Mountain Table and on

Stronghold Table in the South Unit (Bureau of Reclamation 1999).

Riparian-Wet Meadow. Three riparian-wet meadow types occur within the riparian-wet meadow vegetation community in the South Unit. They are Prairie Cordgrass-Sedge Wet Meadow, Pale Spikerush Wet Meadow, and Great Plains Cattail-Bulrush Marsh. Prairie Cordgrass-Sedge Wet Meadow is rare within the Badlands and is restricted to the margins of perennial linear wetlands and drainage bottoms. Prairie cordgrass is the dominant species with associated sedge species (*Carex* spp.). Pale Spikerush Wet Meadow is found throughout the park in association with saturated/inundated soils occurring in depressions, drainages, along pond margins, and water conveyance ditches that hold water for at least part of the growing season. Pale spikerush is found in association with other spikerush species (*Eleocharis* spp.) and foxtail barley (*Hordeum jubatum*). Great Plains Cattail-Bulrush Marsh is an introduced emergent wetland that occurs throughout the park, occupying edges of man-made ponds and dugouts where saturated soils or shallow water is present on a mostly permanent basis. This community is dominated by species of cattail (*Typha latifolia* and *Typha angustifolia*) and bulrush (*Scirpus validus* and *Scirpus americanus*) and forms mostly around and in constructed ponds and reservoirs (Bureau of Reclamation 1999).

Introduced Grasslands. Three grassland types occur within the introduced grassland vegetation community in the South Unit. They are Crested Wheatgrass Grassland, Smooth Brome Grassland, and Kentucky Bluegrass Grassland. These introduced grassland types are found on relatively level areas associated with disturbed areas along park roadsides and around facilities, abandoned fields on Sheep Mountain Table, and grasslands that were interseeded with exotic grasses on Cuny and Stronghold Tables. While crested wheatgrass (*Agropyron cristatum*), smooth brome (*Bromus inermis*), and Kentucky bluegrass (*Poa pratensis*) are the dominant species in these vegetation communities they are often associated with numerous invasive species. However, smooth brome and Kentucky bluegrass often form monotypic stands. Many

species of forbs and shrubs are also found in these grasslands (Bureau of Reclamation 1999).

Shrublands

Shrublands cover about 7,272 acres (2,942 ha), or 5 percent of the South Unit. They are mainly along river and creek floodplains and on sand deposits, mesic slopes, and gravelly or rocky draws. The shrublands most widespread in the park, dominated by silver sage (*Artemisia cana*), are regularly found on floodplains and adjacent slopes. Sand hills support extensive stands of sand sage (*Artemisia filifolia*) shrubland, particularly in the southern half of the park. Soapweed (*Yucca glauca*) stands typically are found along the margins of buttes, on low sandy ridges, and on dry canyon sides. Mesic draws, swales, slopes, and drainages support patches of various broad-leaved shrubs, including silver sage, western snowberry (*Symphoricarpos occidentalis*), chokecherry (*Prunus virginiana*), American plum (*Prunus americana*), and ill-scented sumac (*Rhus trilobata*).

Dry Plains Shrublands. Three shrubland types occur within the dry plains shrublands vegetation community in the South Unit. They are Sand Sage-Prairie Sandreed Shrubland, Soapweed-Prairie Sandreed Shrubland, and Common Rabbitbrush Shrubland. Sand Sage-Prairie Sandreed Shrublands occupy sand hills and high sand ridges, which are mostly disturbed on Red Shirt and Blind Man Tables with small amounts found on Sheep Mountain Table and the eastern edge of the Palmer Creek subunit. While sand sage is the dominant species soapweed can become a codominant species on lower sand ridges and interfaces of sand hills with butte tops. Herbaceous cover is sparse to moderate typically consisting of prairie sandreed (*Calamovilfa longifolia*) and other graminoids. Soapweed-Prairie Sandreed Shrublands occupy sandy ridges and silty clay flats on butte edges. Sandy ridges are predominant near the White River in the South Unit. Soapweed is the dominant species but there is typically good herbaceous cover including prairie sandreed and other graminoids. Common Rabbitbrush Shrublands occupy recently disturbed areas along park roadways (Cuny Table Road and Red Shirt Road) and moderately steep drainages.

Common rabbitbrush (*Chrysothamnus nauseosus*) forms nearly monotypic stands with few other shrubs and a dense herbaceous layer (Bureau of Reclamation 1999).

Mesic Plains Shrublands. Four shrubland types occur within the mesic plains shrublands vegetation community in the South Unit. They are Chokecherry-American Plum Shrubland, Western Snowberry Shrubland, Ill-Scented Sumac-Threeleaf Sedge Shrubland, and Greasewood-Western Wheatgrass Shrubland. Chokecherry-American Plum Shrublands occupy mesic draws and occasionally at the seep zones on the edges of sandhills, mesic hillslope slumps, and in old river oxbows. Chokecherry and American plum stands are very dense typically with a border of other shrubs and sparse herbaceous cover. Western Snowberry Shrublands are common in mesic swales, depressions, draws, oxbows, and drainage bottoms in the South Unit with large stands occurring in the Palmer Creek subunit. Western snowberry is the dominant shrub species in this dense cover community type with herbaceous species contributing sparse vegetative cover. Sparse stands of Ill-Scented Sumac-Threeleaf Sedge Shrublands occur throughout most of the park along the upper cliff borders of buttes, and on some ridges and knolls with moderately sparse stands occurring in areas in the South Unit. Ill-scented sumac can form open shrublands along the top of cliffs and the edges of draws or denser shrublands on ridges and hilltops. Greasewood-Western Wheatgrass Shrubland is uncommon in the Badlands with small stands occurring on alkaline flats on Cuny Table and Plenty Star Table and alkali-affected drainageways in the South Unit. Greasewood-western wheatgrass shrublands have sparse cover with greasewood (*Sarcobatus vermiculatus*) as the dominant large shrub species with other shrubs, grasses, and forbs occurring to a lesser extent (Bureau of Reclamation 1999).

Riparian Shrublands. Three shrubland types occur within the riparian shrublands vegetation community in the South Unit. They are Silver Sage-Western Wheatgrass Shrubland, Sandbar Willow Shrubland, and Buffaloberry Shrubland. Silver Sage-Western Wheatgrass Shrublands

occur widely throughout the Badlands but are mostly confined to drainage bottoms, creeks, and rivers. They may occur on gentle to moderate hillslopes and along the edges of broad drainages. The cover of silver sage is variable within this community depending on flooding regime and disturbance. Sites that are relatively undisturbed have higher densities of silver sage and good cover by western wheatgrass. Sandbar Willow Shrublands are limited in size and rare within the Badlands and occur along the banks of White River and Fog Creek in the South Unit on nearly level sites where moist sediments collect or adjacent to some wetland communities. Mature stands have dense sandbar willow (*Salix exigua*) cover with relatively sparse cover while stand is becoming established. Buffaloberry Shrublands are uncommon in the Badlands and occur in very dense small patches along the White River and near the White River Visitor Center in the South Unit. Buffaloberry (*Shepherdia argentea*) shrublands establish in riparian zones along streams and rivers after other species such as eastern cottonwood have colonized (Bureau of Reclamation 1999).

Woodlands

Woodlands are uncommon in Badlands, covering about 2,566 acres (1,038 ha), or 2 percent of the South Unit. They generally are restricted to floodplains, drainage bottoms, the toes of sand hills, draws associated with eroding buttes, and slumps on butte and cliff faces. Rocky Mountain juniper (*Juniperus scopulorum*) forms the most common woodland in the park, growing on drier slopes and slumps, along butte edges, and in upper draws. Ponderosa pine (*Pinus ponderosa*) woodlands can be found in the upper elevations of the South Unit. Hardwoods are found in more mesic sites, including the bottoms of draws, river floodplains, and the toes of sand hills, with green ash (*Fraxinus pennsylvanica*) and American elm (*Ulmus americana*) being the most common trees. Extremely mesic sites, along river floodplains, minor streams, seeps, springs, and ponds, support stands of eastern cottonwood (*Populus deltoides*) and peachleaf willow (*Salix amygdaloides*).

Dry Coniferous Forest and Woodlands. Two woodland types occur within the dry coniferous forest and woodlands vegetation community in the South Unit. They are Rocky Mountain Juniper-Littleseed Mountain Ricegrass Woodland and Ponderosa Pine-Rocky Mountain Juniper Woodland. Rocky Mountain Juniper-Littleseed Mountain Ricegrass Woodlands occupy dry draws and the edges of buttes and tables on all aspects. Rocky Mountain juniper is the dominant overstory canopy species with little-seed mountain ricegrass (*Oryzopsis micrantha*) common in the sparse herbaceous layer. Ponderosa Pine-Rocky Mountain Juniper Woodlands occupy the rims of some tables and buttes (Cedar Buttes and Red Shirt Table) and the heads of some steep draws in the Palmer Creek subunit. Canopy cover varies from open along buttes and table tops to fairly closed within draws with ponderosa pine and Rocky Mountain juniper as the dominant species in the overstory with a sparse shrub layer and moderate herbaceous layer consisting mostly of little bluestem and sideoats grama (Bureau of Reclamation 1999).

Riparian Deciduous Forest and Woodlands.

Three woodland types occur within the riparian deciduous forest and woodlands vegetation community in the South Unit. They are Green Ash-American Elm-Chokecherry Woodland, Eastern Cottonwood-Peachleaf Willow-Sandbar Willow Woodland, and Russian Olive Woodland. Green Ash-American Elm-Chokecherry Woodland occurs throughout the badlands occupying mesic draws, small perennial drainages, and the outer edges of river floodplains. The dominant species is green ash with lesser amounts of American elm and a sparse shrub and herbaceous layer. Eastern Cottonwood-Peachleaf Willow-Sandbar Willow Woodland occurs in the floodplain of river and smaller creeks and drainages, on the margins of ponds and reservoirs, and seeps and springs in mesic draws. This woodland has various canopy cover depending on stand age and position of the landscape that is dominated by eastern cottonwood with lesser amount of peachleaf willow. Older stands of eastern cottonwood and willow are typically invaded by green ash and eastern red cedar (*Juniperus virginiana*).

Russian Olive Woodland is very limited within the Badlands with one occurrence along the White River near the White River Visitor Center. The community is dominated by Russian olive (*Elaeagnus angustifolia*) with dense sandbar willow (*Salix exigua*) shrub cover and a sparse herbaceous layer (Bureau of Reclamation 1999).

Sparsely Vegetated Areas

About 46 percent of the South Unit (63,123 acres, or 25,544 ha) is sparsely vegetated or barren. The Badlands formations provide a harsh, inhospitable environment for vegetation. Moisture is usually scarce, and rapidly runs off the steep slopes instead of soaking into the ground. Surface temperatures are often extreme. Sparse vegetation grows on the park's pinnacles, cliffs, mounds, outwash fans, intermittent drainages, and low hills covered by chalcedony (a flat, crystalline rock with properties similar to quartz). Sparse vegetation also is found in areas of established prairie dog towns. Constant prairie dog use of these areas results in a weedy, forb-dominated community.

Three sparsely vegetated area types occur within the sparsely vegetated vegetation community in the South Unit. They are Eroding Great Plains Badlands Sparse Vegetation, Wild Buckwheat-Snakeweed Badlands Sparse Vegetation, Great Plains Badlands Sparse Vegetation Complex, and Blacktailed Prairie Dog Town Complex. Blacktailed Prairie Dog Town Complex is widespread throughout the Badlands and range in size from less than one hectare to several hundred hectares. This community type typically occurs on level sites along drainages, in broad valleys, on gentle to moderately sloping hillslopes, and flats on tables and buttes. Vegetation is extremely variable and is dependent on age of town, soil type, and prairie dog population density. Vegetation type varies from the outer edges of the town inward with the outer edges typically dominated by western wheatgrass, blue grama, and buffalo grass. Species distribution is patchy with varying degrees of dominance within stands typical of early successional species on disturbed sites. Eroding Great Plains Badlands Sparse Vegetation, Wild Buckwheat-Snakeweed

Badlands Sparse Vegetation, and Great Plains Badlands Sparse Vegetation are widespread within the Badlands on exposed spires, cliffs, ridges, slopes, narrow gorges, buttes, mounds, fans, and drainages. Soils are undeveloped, poor, loose, and easily eroded on gently sloping to steeply sloping areas. These areas range from mostly devoid of vegetation to sparsely covered, typically with less than 1 percent cover and rarely exceeding 10 percent cover by wild buckwheat (*Erigeron pauciflorum*), snakeweed (*Gutierrezia sarothrae*), and curlycup gumweed (*Grindelia squarrosa*). Vegetation is relatively evenly distributed on level terrain and grows in patches on steeper slopes and cliffs (Bureau of Reclamation 1999).

Approximately an additional 1 percent of the South Unit is covered by other largely nonvegetated features, including developments, roads, utilities, drainages, ponds, and quarries.

Special Status Species—Rare Plants

There are no federally listed plant species in Badlands National Park. However, several plants are listed as rare by the state. Three rare species endemic to the region are found primarily in sparsely vegetated badland areas: Barr's milkvetch (*Astragalus barrii*), Dakota buckwheat (*Eriogonum visheri*), and sidesaddle (or Secund) bladderpod (*Lesquerella arenosa* var. *argillosa*). Two state-listed rare plants are found in the park's prairies but are not endemic to the region, Easter daisy (*Townsendia exscapa*) and large flower Townsend daisy (*Townsendia grandiflora*).

Badlands has potential habitat for four state-listed rare plants that have not been recorded in the park to date, but may be there. Hopi tea (*Thelesperma megapotamicum*) grows in open sites. Hairy virgin's bower (*Clematis hirsutissima*) is often found near streams and creeks. Parry's rabbitbrush (*Chrysothamnus parryi*) grows in dry open plains. Silver-mounded candleflower (*Cryptantha cana*) is a perennial endemic that grows on dry sandy and gravelly soils of rangelands and slopes.

Exotic Plants

Exotic (nonnative) plants can be found throughout the park on lands that have been disturbed by human activities. Grazing and dryland farming introduced exotic plants into Badlands. Seeds from lands outside the park also have blown in or have been carried into Badlands inadvertently. A total of 71 exotic plant species are known to grow in Badlands National Park. The distribution of most annual exotic plants is limited; they are found primarily in disturbed areas. Most of the species have been in the area for a long time and are likely to continue to exist in disturbed areas, posing little threat to native species.

Two exotic annual grasses, Japanese brome and downy brome (*Bromus tectorum*) are very common along foot and game trails. These species usually are present to some degree in all the park's grasslands, especially the western wheatgrass stands. Other relatively common exotic species found in various disturbed sites are smooth brome, crested wheatgrass, Kentucky bluegrass, alfalfa (*Medicago sativa*), Canada thistle (*Cirsium arvense*), and giant ragweed (*Artemisia trifida*).

A biennial yellow sweetclover (*Melilotus officinalis*) is widespread through the North Unit. During peak growing years, this plant can grow to about four feet tall, covering native grasslands. This plant is of concern because it may be causing ecological damage by its soil chemistry changes. Livestock grazing has an influence on the distribution and abundance of yellow sweetclover. Yellow sweetclover seems to be suppressed in the South Unit by livestock grazing and drier soils. The removal or reduction of livestock grazing may cause an increase in the distribution and abundance of yellow sweetclover in the South Unit.

Four of the annual exotics are of special concern for park managers. Japanese brome and downy brome both have demonstrated an ability to spread into native prairie, where they directly compete with native species. Halogeton (*Halogeton glomeratus*), which is common on badlands features in the Cedar Pass area, is poisonous to ungulates. At high density this plant could pose a risk to the park's bighorn

sheep population. Puncture vine (*Tribulus terrestris*), common along the edges of park's gravel-surfaced roads, frequently causes flat tires on visitors' bicycles, interfering with the visitor experience.

Noxious weeds in the park that have been designated by the county and state are the puncture vine mentioned above, field bindweed (*Convolvulus arvensis*), spotted knapweed (*Centaurea maculosa*), Russian knapweed (*Centaurea repens*), houndstongue (*Cynoglossum officinale*), perennial sow thistle (*Sonchus arvensis*), and Canada thistle. Infestations of Canada thistle are present, with the plant growing in an estimated 8,000 acres, of which almost 5,000 acres are in the park. Canada thistle primarily grows adjacent to roads and along watercourses, in wooded draws and swales, adjacent to wildlife water impoundments, and in prairie dog towns. It also is invading native grasslands. The plant has greatly altered riparian vegetative communities, excluding native vegetation.

Three other noxious species, leafy spurge (*Euphorbia esula*), hoary cress (*Cardaria draba*) and Dalmatian toadflax (*Linaria dalmatica*), are not known to be in the park at present but are expected to invade during the life of this plan. Leafy spurge can be found immediately west, east, and south of the park.

Tamarisk (*Tamarix* spp.) is just starting to invade the White River from upstream. It probably will spread along the two-mile stretch of the river in the park.

The staff has several ongoing efforts to control the spread of exotics in the North Unit and in the South Unit as necessary. Most of the effort has focused on stopping the spread of Canada thistle, with both chemical and biological controls being used, mowing, fire, and interseeding of native grasses (NPS 2006c, 2007c). In addition, much work has been done in the past five years to manage knapweeds. Cool-season exotic grasses have been experimentally treated since 2000 with spring prescribed fires, followed by interseeding with native species.

Vegetation and People

Ranching, grazing, the elimination and reduction of native wildlife, and fire suppression have substantially affected the grasslands in Badlands National Park. Little of the land now in the park was plowed, but dryland farming was practiced in scattered areas throughout the park. Horses, cattle, and sheep also grazed on much of the native grasslands now in the park. Livestock grazed all of Badlands from 1942 to 1962 (Langer 1998). The OST still exercise their tribal grazing rights for domestic livestock in the South Unit; thus, livestock grazing continues through much of the South Unit.

The agricultural activities in both the North and South Units introduced exotic plants into the park and changed the distribution and extent of the natural vegetative communities. Introduced grasslands dominated by smooth brome, crested wheatgrass, and Kentucky bluegrass now occupy about 2 percent of the park. In the past, the NPS also planted nonnative grasses along road corridors, around facilities, and at overlooks.

Frequent low to moderate intensity fires formerly maintained the prairie ecosystem, but since the early 20th century, nearly all fires within park boundaries were extinguished before they could spread far. Without fire, the density and variety of plant species, particularly forbs, were altered — without fires, there are fewer annual forbs. However, starting in the early 1980s (and more often in the 1990s) prescribed burning has been used in the park to substitute for natural wildland fires. About 5,000 acres are burned annually in the North Unit; no acres are treated with fire in the South Unit.

The primary impact of visitors on park vegetation probably is the unintentional transport of exotic plants into and around the park. Seed can be transported in on vehicles and clothing, resulting in the introduction and spread of exotic plants. Other visitor impacts on park vegetation have not been documented. However, trampling of vegetation has been observed, particularly at overlooks along the Loop Road. In the South Unit there has been some (illegal) off-road vehicle driving, which has resulted in trails and loss of vegetation. Much vegetative

disturbance has been caused on Sheep Mountain Table by off-road vehicle travel and frequent human-caused fires.

Tribal members gather fruits, berries, nuts, wood, and traditional plants in the South Unit. This is allowed under the provisions of PL 90-468 (which added this area to the park), the *American Indian Religious Freedom Act*, and the 1976 memorandum of agreement with the OST. It is not known if this activity has positively or negatively affected any of the park's native plants.

Wildlife

A variety of wildlife species occupy the Badlands woodlands, shrublands, and grasslands. There are small mammals, ungulates, birds, reptiles, amphibians, and invertebrates. A total of 37 mammal species, 202 bird species, 11 reptile and amphibian species, and 15 fish species have been documented in the Badlands (NPS 2007a). In addition, 25 mammal species, 32 bird species, 9 reptile and amphibian species, and 8 fish species are probably present or unconfirmed in Badlands (NPS 2007a). One mammal species, one amphibian species, and one fish species are considered encroaching on the park (NPS 2007a). There are numerous arthropod and other insect species.

Ungulates

White-tailed deer generally are restricted to scarce riparian habitats and are seen infrequently. Pronghorn and mule deer are commonly seen. Both deer and pronghorn move in and out of the park and are hunted on lands adjacent to the park, and they are hunted by tribal members in the South Unit. Grazing also may affect ungulate numbers in the South Unit, although this has not been documented.

Two species of special interest in the Badlands are bison and bighorn sheep. Both of these species were extirpated from the park in the late 1800s and early 1900s.

Bison. Bison do not currently occupy the South Unit. Bison were restored to the North Unit of the park in 1963, and more were released in 1983.

The concept of reintroducing bison into the South Unit is mentioned in the memorandum of agreement with the OST. To date, no bison reintroductions have occurred in the South Unit.

Bighorn Sheep. Rocky Mountain bighorn sheep were restored to Badlands in 1964 to fill the ecological niche formerly occupied by the now extinct Audubon's bighorn sheep. The sheep now number between 58 and 74 animals in Badlands, with the South Unit sub-population accounting for 10 to 20 sheep (Bourassa 2001). In the South Unit, they are found primarily in the vicinity of Cedar Butte. A key migratory route for the bighorns (and other wildlife) is the narrow neck between the North and South Units, which is bisected by SD 44. However, much of the historic bighorn sheep habitat in the park remains unoccupied. In addition, the sheep population suffered a major decline between 1994 and 1996. The cause of the decline is not known, but an epizootic disease is suspected. As a result, the sex ratios are skewed in the park. Thus, the long-term survival of the bighorn sheep population is uncertain in the park.

Carnivores

Twelve species of carnivores are present in the Badlands, including coyote, bobcat, red fox, and American badger. Coyote and bobcat are the only carnivore species that are common. Since 1960 there have been 30 documented records of badger in the park and 16 documented records of the red fox; therefore, these species are considered uncommon (NPS 2002). The black-footed ferret and swift fox are addressed in the section concerning special status species.

Small Mammals

Small mammal species common in the park are least chipmunk, eastern and desert cottontail rabbit, thirteen-lined ground squirrel, black-tailed prairie dog, deer mouse, muskrat, and several other smaller rodents.

Black-tailed Prairie Dog. The state of South Dakota classifies the black-tailed prairie dog as a species of management concern. This herbivorous, social, ground squirrel is considered a keystone species of the Great Plains.

Black-tailed prairie dogs live in large communities called colonies or towns. Groups of colonies make up a complex. Historically, prairie dogs lived in large, interconnected colonies that contained thousands of individuals and extended for miles. Most black-tailed prairie dog colonies today are smaller than 100 acres, disjunct, and geographically isolated from other colonies.

Black-tailed prairie dogs alter their environment, forming a microhabitat in mixed grass prairies. They alter the soil structure by digging burrows and alter the type and density of plant cover, providing sites for forbs that generally are less common in prairie communities. They reduce the height of vegetation and change the density and abundance of other wildlife, including birds and small mammals (Agnew 1983; Colo. State Univ. 1982; Cincotta, Uresk and Hansen n.d.).

A number of species depend on prairie dogs to varying degrees for their survival. At least nine species depend directly on prairie dogs or their activities to some extent, and 137 more species are associated opportunistically (Kotliar et al. 1999). Prairie dog burrows provide shelter for burrowing owls, rattlesnakes, swift foxes, and many other animals. The prairie dogs themselves are prey for black footed ferrets, ferruginous hawks, golden eagles, and many other predators. Sharps and Uresk (1990) found that at least 40 percent of all vertebrates west of the Missouri River are associated with prairie dog towns.

Today, black-tailed prairie dogs inhabit approximately 1 to 2 percent of their original home range in North America. In South Dakota, occupied prairie dog habitat declined from more than 1,757,000 acres in 1918 to about 147,000 acres in 1999 (*Federal Register* Feb. 4, 2000, 5481). The primary causes of decline of the species in South Dakota are conversion of mixed-grass prairie ecosystem to farm and ranchland, poisoning, and the spread of sylvatic plague in a national context (USFWS 2000). The vulnerability of the species to further decline depends upon many factors such as number, size, and spatial distribution of prairie dog colonies; barriers to colonization and expansion; and the nature of direct threats to prairie dog well-being.

The historic extent of black-tailed prairie dogs within the boundaries of Badlands National Park is unknown. In 2001, several small, previously undetected towns were found and mapped in the South Unit and the Palmer Creek Unit, increasing the total acreage of active prairie dog towns in those units to 1,396 acres. Towns are spread out over the entire park in low-lying, flat, grassy regions that are separated by badland formations and drainages. Most of the towns are small and fragmented, but both units still support large prairie dog complexes — there is a 430-acre complex composed of 18 towns in the South Unit.

It is estimated that only about 3 to 5 percent of suitable habitat in the South Unit is occupied by prairie dogs. This could indicate that the prairie dogs in the park have the ability to expand. The South Unit has potential for prairie dog expansion because cattle still graze in that area.

Information from five years of mapping and density estimates of the population indicates that the Badlands prairie dog population is stable or increasing slightly. Some towns have decreased because of the invasion of Canada thistle and clover, but most towns are stable. The reason that prairie dog numbers are not increasing and towns are not expanding may be related to five to six years of above-normal precipitation, with corresponding vegetation growth and less grazing pressure. For prairie dog towns to expand vegetation resources must be low.

A Black-tailed Prairie Dog Management Plan was completed for the North Unit in 2007. The principal objectives of the management plan are to ensure that the black-tailed prairie dog is maintained in its role as a keystone species in the mixed-grass prairie ecosystem on the North Unit, while providing strategies to effectively manage instances of prairie dog encroachment onto adjacent private lands (NPS 2007b). Plague was detected in the North Unit black-tailed prairie dog population for the first time in 2009. Deltamethrin dusting efforts have been ongoing in the North Unit to protect existing populations of black-tailed prairie dogs, as well as black-footed ferrets (NPS 2009b). Currently, there is no black-tailed prairie dog management plan for the South Unit or plague dusting efforts.

Birds

Badlands National Park provides habitat for a diverse bird population, including raptors, waterfowl, shorebirds, herons, cranes, woodpeckers, and songbirds. Most of the park's bird species are either summer residents or migrants. Approximately 68 bird species have been observed nesting in the park. Common bird species found in the park include northern harrier, red-tailed hawk, prairie falcon, sharp-tailed grouse, killdeer, mourning dove, red-headed woodpecker, yellow-shafted flicker, eastern kingbird, Bell's vireo, warbling vireo, black-billed magpie, American crow, bank swallow, cliff swallow, barn swallow, mountain bluebird, American robin, field sparrow, dickcissel, and red-winged blackbird (NPS 2007b).

The sharp-tailed grouse is representative of the prairie ecosystem. It is suspected that grouse leks ("—dancing grounds," where courtship —dances occur) are in the park, although only one has been identified in the South Unit. Golden eagles are fairly common in the park in winter, and they nest in the park. Loggerhead shrikes also are common in the summer. Other birds of special interest that are summer or winter park residents include the long-eared owl, barn owl, burrowing owl, great horned owl, ferruginous hawk, Swainson's hawk, and wild turkey.

Burrowing owl are small owls that usually reside in treeless areas with short vegetation, primarily in association with prairie dogs. Burrowing owls have been found to nest on prairie dog colonies, both active and inactive, as long as the burrow system is intact (NPS 2007b). Because of their dependence on active prairie dog burrow colonies for breeding habitat, long-term persistence of well-connected, large, active prairie dog towns is important for the future of the burrowing owl (NPS 2007b). From 1994 to 1996, the burrowing owl was designated by the U.S. Fish and Wildlife Service (USFWS) as a Category 2 species for consideration to be listed as a threatened or endangered species. In 1996, the Category 2 designation was discontinued. The species is currently listed by the USFWS as a National Bird of Conservation Concern. The

burrowing owl is not listed as endangered or threatened by the state of South Dakota (Klute et al. 2003).

Reptiles and Amphibians

Common amphibians found within Badlands National Park include the Plains spadefoot toad, Great Plains toad, and the chorus frog. Common reptiles found within the park include the red-sided garter snake, Western Plains garter, western hognose snake, bullsnake, and prairie rattlesnake (NPS 2007b).

Insects

Common butterfly species found in Badlands National Park are eastern tiger swallowtail, checkered white, cabbage white, clouded sulphur, striped hairstreak, Melissa blue, regal fritillary, Atlantis fritillary, variegated fritillary, pearl crescent, Wiedemer's admiral, viceroy, mourning cloak, red admiral, painted lady, hackberry emperor, common wood nymph, common check skipper, and Delaware skipper. Several species of grasshoppers and crickets (Orthoptera) along with elm leaf beetles and elm bark beetles are also common within Badlands National Park.

PALEONTOLOGICAL RESOURCES

The White River Badlands, which encompass both the North and South Units, contains the largest known assembly of Late Eocene and Oligocene Eocene mammal fossils in North America. Recognition of mako sica (bad land) as a significant paleontological area extends back to the traditional American Indian oral history of the area (Kiver and Harris 1999). Lakota people found large fossilized bones, fossilized seashells, and turtle shells. The OST considers paleontological resources to be part of their oral history and traditional beliefs (Potapova and Rom 2009)

Euro-American paleontological interest in the area began in the 1840s, when trappers and traders traveling along the Fort Pierre to Fort Laramie trail occasionally collected fossils. Alexander Culbertson, an agent of the American Fur Company, made the first collection from the

area. Culbertson sent a fossilized jaw fragment to Dr. Hiram A. Prout, who described and published it in 1846 (Macdonald 1951).

The Badlands has played a major role in the development of the science of paleontology. Scientists from major universities, museums, and the government have been attracted to and collected in this area. Thousands of specimens are housed in museums and collections around the world. Hundreds of scientific papers on the White River Badlands have been published. Many important finds from the area have served to define the North American Land Mammal Ages in the Late Eocene and Oligocene Epochs. Fossils from this area have provided valuable information for understanding mammalian evolution and diversity, paleoecology, and paleoclimates. Paleontological resources were a major reason for establishing Badlands National Monument in 1939 and designating the monument a national park in 1978 (NPS 2006a).

Marine fossils are found in the deposits of an ancient sea that existed in the region some 75 million to 67 million years ago, during the Cretaceous Period. Fossils that have been found in the Pierre Shale and Fox Hills Formations include ammonites, nautiloids, fish, marine reptiles, marine turtles, plesiosaurs (large marine reptiles), and mosasaurs (giant marine lizards) (NPS 2006a).

During the Late Eocene and Oligocene Eocene Epochs, 37 million to 25 million years ago, a great variety of animals lived in the Badlands. Untold numbers of those that died in the rivers, streams, swamps, floodplains, and lakes were preserved by layers of sediments. Fossils from the White River Group found in the park include camels, three-toed horses, oreodonts (a sheep like animal, the most common mammal found), antelope like animals, brontotheres (or —titanthere,” large grazing animals that resembled a rhinoceros), rhinoceroses, false deer, rabbits, beavers, creodonts (predatory animals), saber-toothed cats, land turtles, rodents, and birds (NPS 2006a).

All of the South Unit potentially contains fossils, but only a small percentage of the area has been inventoried for paleontological resources. Since 2002, the OST has implemented a moratorium

on excavation and collection of fossils. Due to this moratorium, Badlands National Park has refrained from conducting fossil inventories within the South Unit. However, paleontological inventories have been carried out on tribal lands adjacent to the South Unit with OST and Bureau of Indian Affairs (BIA) authorization (Rom, pers. comm., 2010).

The soft sediments of the White River Badlands allows fossils to disintegrate within a few years after exposure, when protective, surrounding sediments are removed, either by natural forces or human interaction. Exposed surface fossil are often lost before they can be recorded, legally collected, or preserved. Fossil collecting is known to be a popular activity. Visitors pick up an unknown amount of material every year, and an unknown amount of illegal commercial and private collecting also occurs in the park. Indications are that large scale collecting is prevalent in the South Unit. The park initiates 20 to 25 cases a year, which typically results in three to four citations / prosecutions a year (NPS 2006a).

There are three main issues, which threaten the preservation and future survival of fossils in this area (Potapova and Rom 2009):

1. **Natural Deterioration.** The fossils, if not legally collected, will be destroyed by weathering or erosion very quickly after exposure.
2. **Livestock Trampling.** If the area is used for livestock grazing most fossils will quickly be destroyed from trampling and increased erosion; and
3. **Theft.** Large specimens, especially complete skulls, mandibles, and skeletal parts, are generally easy to locate and remove.

SOUNDSCAPE

NPS *Management Policies 2006* and Director's Order 47, *Soundscape Preservation and Noise Management*, recognize that natural soundscapes are a park resource and call for the NPS to preserve, to the greatest extent possible, the natural soundscapes of parks (NPS 2000,

2006b). The policies and Director's Order further state that the NPS is to restore degraded soundscapes to the natural condition whenever possible and protect natural soundscapes from degradation due to noise (undesirable human-caused sound). The natural soundscape (sometimes called natural quiet) is one resource that makes the South Unit a special place. Noise can cause direct or indirect adverse effects on the natural soundscape and other resources. It also can adversely affect the visitor experience. Visitors to the South Unit have the opportunity to experience solitude and tranquility in an environment of natural sounds. Actions in the alternatives that could potentially increase noise levels would be of concern to park managers, visitors, and the public.

Little quantitative information about sound levels in Badlands is available, but the park generally is considered to be a relatively quiet place. There is little noise caused by people in most of the park. Vehicles generate noise on various roads used for recreation and as farm-to-market routes (park neighbors hauling livestock and grain through parts of the park). The traffic mix includes recreational vehicles of all sizes, commercial trucks, and local residents' cars throughout the perimeter of the South Unit. Other sound disruptions are created by visitors talking and shouting, park administrative operations at the White River Visitor Center, and aircraft overflights (including military flights and commercial tour helicopters). In addition to road corridors, the primary developed areas where these sounds can be heard are visitor and administrative facilities, such as the White River Visitor Center.

Ambient sound in Badlands National Park can mostly be attributed to wind blowing through the prairie and badlands formations. Sounds from wildlife (such as bison and birds) are often heard. Interestingly, Badlands' ambient soundscape is believed to be "loder" than that of other parks in the Rocky Mountains and Colorado Plateau. This is probably due to the open landscape and the prevailing winds that blow through the Badlands area (Foch Assoc., Dr. James D. Foch, pers. comm., Dec. 19, 2001 as cited in NPS 2006b).

CULTURAL RESOURCES

The OST Tribal Historic Preservation Officer considers all cultural resources to be eligible for the National Register of Historic Places, and for a proposed OST Register. The Tribal Historic Preservation Officer defines cultural resources to include archeological sites, paleontological resources, ethnographic resources, traditional cultural properties, gathering areas, spiritual areas, landscapes or specific places, human remains, artifacts, fossils, museum collections, and some structures. Increased public access and erosion have the potential to adversely affect these cultural resources.

Archeological Sites

Federal land managers are required under Section 110 of the *National Historic Preservation Act* to develop plans for surveying lands under their control to determine the nature and extent of archeological resources on those lands. Although there has not been a comprehensive survey of archeological resources of the South Unit, several individual surveys have been conducted and 57 archeological resources have been recorded (Vawser, pers. comm., 2010).

Currently, there are 27 known and recorded archeological sites in the South Unit. Fourteen of the known sites are prehistoric artifact scatters; eleven of the sites are hearth or fire pit features that have been exposed in erosional surfaces, such as gullies or mesa edges. There is also one circular feature and one historic foundation. Four of these sites have been dated, and range from 1390 to 2280 years old. Sites in the South Unit could be as old as 10,000 years. There are additional known archeological locations, which are unrecorded.

Museum Collections

There are no museum collection facilities within the South Unit that meet the requirements of 36 CFR 79 (Curation of Federally-Owned and Administered Archeological Collections). There is a partial listing of records for collections taken from the South Unit. Collections from the South Unit are stored at the South Dakota

Archaeological Research Center, the South Dakota School of Mines and Technology Museum of Geology, the OST Historic Preservation Office, the Badlands National Park collections facility, the Midwest Archeological Center, and at other museum facilities in North America and around the world. The South Unit collections consist of approximately 7,190 catalog records of vertebrate and invertebrate fossils from the Late Cretaceous, Late Eocene, and Oligocene. There is also a small collection of archeological materials.

Construction of a new storage and curation facility was completed in 2005 at the North Unit. Located at Cedar Pass, the facility meets current NPS museum standards for storage (36 CFR 79). Collections not used for display purposes are curated at that location. As appropriate, the NPS would consult with tribal members before treating or reproducing items in NPS collections (NPS 2006b, section 5.3.5.5; NSP 2006d; NPS 2008b).

Ethnographic Resources

The NPS recognizes four categories of cultural landscapes: historic designed landscapes, historic vernacular landscapes, historic sites, and ethnographic landscapes. Ethnographic resources (such as a site, structure, landscape, or natural resource feature assigned traditional legendary, subsistence religious or other significance) and traditional cultural properties exist in the area and are generally acknowledged as part of the historical territory of the Lakota branch of the Sioux. Within the South Unit, ethnographic landscapes that possess the qualities of and have been identified as probable candidates for consideration as cultural landscapes include the site of prolonged Ghost Dances during the fall of 1890; Big Foot's route to the Ghost Dance, Stronghold Table, and Wounded Knee; historic resources associated with Bombing Range use; Oglala Sioux homesteads; and traditional gathering and spiritual areas. No formal assessment of these landscapes has been conducted. World War II bombing practice likely affected cultural resources.

Traditional cultural properties are ethnographic resources that can be associated with cultural practices or beliefs and that are either eligible for inclusion in, or are listed in, the National Register of Historic Places. Such properties could be sites regarded as sacred, locations for gathering resources, activity areas, or other areas of ongoing traditional use.

The South Unit contains evidence of continuing Lakota traditional spiritual uses. Current ethnographic information provided by the OST has indicated that there are several areas known to have special spiritual significance for the Oglala Sioux.

SCENIC RESOURCES

Through the 1916 *Organic Act* the national park system was created to conserve unimpaired many of the world's most magnificent landscapes where visitors can immerse themselves in the beauty of such special places and renew the body, the spirit and the mind. One of the South Unit's outstanding resources and values is the scenic beauty of its landscape that extends far beyond the boundary of the park in sweeping vistas. The scenic resources of the South Unit have a high degree of cultural significance. For centuries the beauty and solitude of this landscape have been important qualities that have added to the importance and value of the spiritual and ceremonial site used by American Indians. These same resources today draw the eye and mind of professional and amateur artists, photographers, and writers whose works communicate the striking scenery of the park to visitors as well as others around the world.

The landscape is composed of flat to gently rolling grassland terraces that weave through and become a visually pleasing contrast to the rugged and barren peaks and gullies that frequent the landscape. For many visitors, the ever-changing play of light and shadows on these contrasting land forms provoke strong emotional responses as they capture one's eye and mind. These views contain a very limited number of contrasting elements, primarily consisting of occasional residences and ranching structures as well as farm roads. The high level

of interest in promoting the creation of the proposed Crazy Horse Scenic Byway is another indication of the beauty and scenic value of the landscape within the South Unit. (OSPRA is pursuing Federal Highway Administration approval for the 215-mile Crazy Horse National Scenic Byway.)

The remoteness and rural nature of the lands adjacent to the park have resulted in limited intrusions to the beauty and clarity of night sky. The intrusions are primarily from occasional residential structures, radio and cellular telephone towers located inside and outside the park boundary. Due to the remoteness of the park and the absence of competing sources of light, the night sky of the South Unit offers unparalleled opportunity to view the wonders and beauty of a boundless starry environment.

VISITOR EXPERIENCE

Badlands National Park is divided into the North and South Units. The North Unit is operating under the *2006 North Unit General Management Plan* (NPS 2006a). The South Unit contains the undeveloped Stronghold area and the Palmer Creek area.

A *Long Range Interpretive Plan* has been prepared for the park (NPS 1999b). The plan outlines interpretive actions to bring the park's stories to visitors in a form they can enjoy and understand. The plan identifies two primary areas that could benefit from recommendations and improvements within the South Unit: the White River Visitor Center, and Sheep Mountain Table. Recommendations related to the White River Visitor Center include the following:

- Developing a closer relationship between the NPS and the Lakota and OST, which would be essential in determining which aspects of Lakota and Sioux history and culture are appropriate to tell, by whom, where, and how;
- Constructing the Lakota Heritage Education Center;
- Waiting for the construction of the Lakota Heritage Education Center and

until closer working relationships with the OST government have developed;

- Providing opportunities for the Lakota people to interpret their own culture, whether as paid NPS employees, as volunteers, or through another cooperative-type relationship;
- Providing wayside exhibits and bulletin boards to introduce visitors to the South Unit, orient them to the park in general, and addressing safety issues; and
- Developing an ethnobotany trail (NPS 1999).

The only recommendation in the Long Range Interpretive Plan concerning Sheep Mountain Table was to provide wayside exhibits addressing orientation and safety issues at the beginning of the unpaved road leading to Sheep Mountain Table (NPS 1999).

Visitor Access

Over the past 11 years, an average of 922,000 visitors has visited Badlands National Park every year (NPS 2010b). Most visitors travel along I-90, the major highway west into the Black Hills. Badlands often is the first stop on a longer trip to Mount Rushmore National Memorial, Wind Cave and Jewel Cave national parks, and Custer State Park. I-90 is also traveled by people going to destinations farther west, such as Yellowstone National Park. Some visitors make a spur-of-the-moment decision to visit Badlands National Park when they see signs along the highway. The OSPRA expects that the Badlands Loop Scenic Byway (designated by the state of South Dakota) and the proposed Crazy Horse Scenic Byway might increase visitation by one million to two million visitors in the next decade (OSPRA 2000).

An average of 9,437 visitors has been counted at the South Unit every year since 2000 (Livermont 2010).

A formal visitor survey completed in July 2001 compiled statistics about visitors such as: group

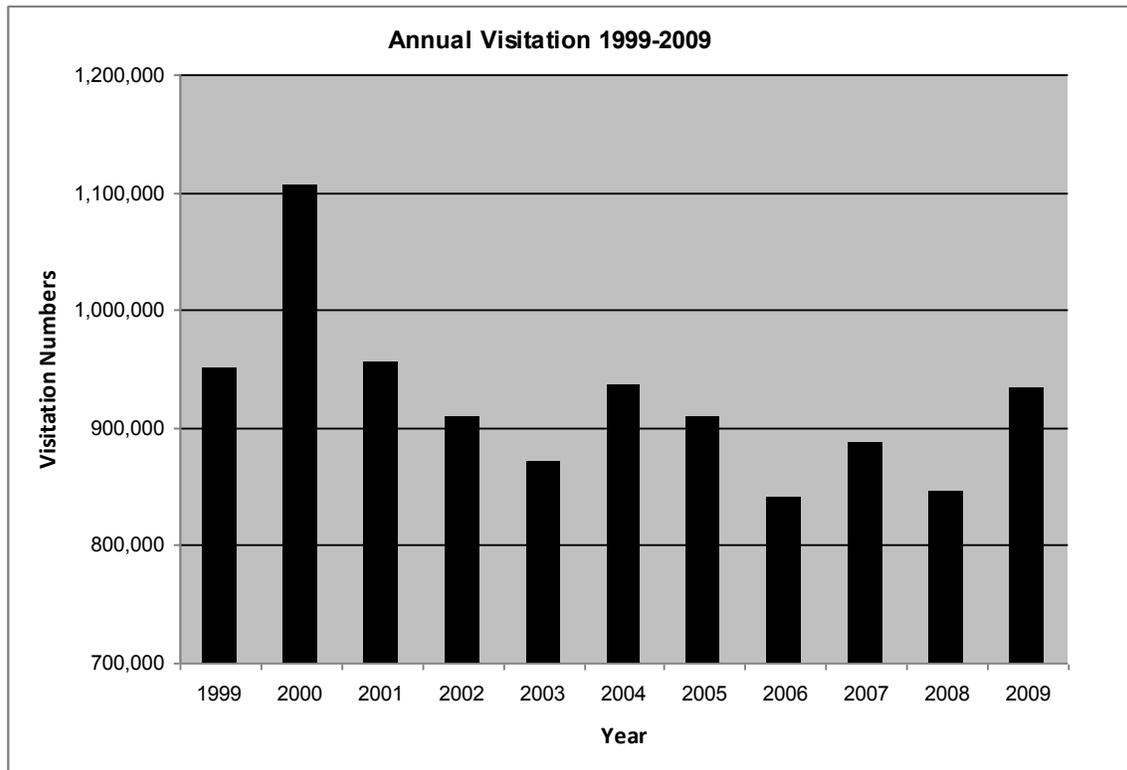
composition, trip origin and destination, length of visit, favorite park sites, and other data (Simmons and Gramann 2001). Park employees have collected other information about visitors at entrance stations, during routine patrols, and from registration of backcountry and wilderness visitors. The information collected from these various sources is summarized in this section.

Visitation

Weather in South Dakota can be extreme, with an average temperature of 90°F in July and August and 80°F in June and September. Record high temperatures of 111°F have been recorded in August. Winters often are extremely cold, with below-zero temperatures as low as -40°F, with heavy, drifting snow and strong winds. The highest visitation to Badlands National Park is in June, July, and August (70 percent of the annual visitation), followed by the “shoulder season” months of September, October, and May. Visitation in the shoulder season has increased recently partly because more retired people are visiting the park (NPS 2006a).

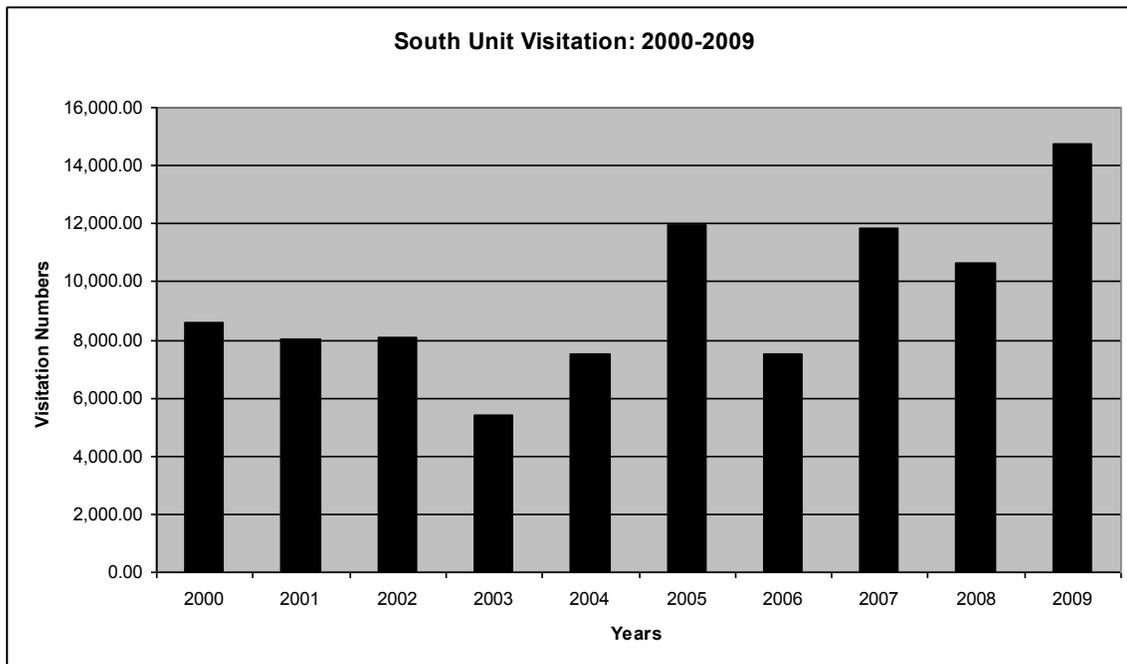
Visitation to the park for the years 1999–2009 is presented in figure 1 (NPS 2010b), and visitation to the South Unit is presented in figure 2. Even though visitation to the park has fluctuated between 1999 and 2009, an average downward trend in overall park visitation of roughly -0.9 percent per year, is apparent. However, approximately one million people per year visited the park in the past five years. Using one million recreation visits as a starting point, a 0.9-percent decline each year would result in visitation of approximately 955,800 recreation visits in five years (by 2014). Over this same period, a 0.9-percent increase in visits would result in about 1,045,800 recreation visits by the year 2014. Projecting future visitation is an inexact art. A steady downward trend is not likely over a long period. Likewise, a long-term upward trend may not be sustainable by the park’s resources or infrastructure. Visitation in the range of 1,000,000 recreation visits plus or minus 10 percent is considered a reasonable forecast, given the historic data presented here.

FIGURE 1. NORTH AND SOUTH UNIT ANNUAL VISITATION



Source: NPS 2010b

FIGURE 2. SOUTH UNIT ANNUAL VISITATION 2000 – 2009



Source: Livermont 2010

Access. The major roads on which visitors can drive to the South Unit are BIA 41 on the west, BIA Route 2 on the south, and BIA Route 27 on the east. BIA 41, a paved two-lane road, travels along the western boundary of the South Unit from the town of Red Shirt to BIA Route 2, passing over Red Shirt Table. BIA 41 intersects BIA Route 2 at the southwest corner of the South Unit. BIA Route 2, a gravel-surfaced road, travels 20 miles along the southern boundary between BIA 41 and BIA Route 27, passing about two miles south of the southern boundary of the South Unit across Cuny Table. The Tribe has requested that the BIA upgrade and pave BIA Route 2.

BIA Route 27, a paved and maintained road that intersects BIA Route 2, travels northwest about 20 miles to the town of Scenic, where it connects with SD 44. The White River Visitor Center lies at the intersection of BIA Route 2 and BIA Route 27.

Vehicles can travel on several primitive two-track roads in the South Unit. These roads are minimally maintained, and high-clearance vehicles are strongly recommended. There are few directional signs, and access is limited, because of road conditions or, in the case of Palmer Creek, it is necessary to cross private property to reach that area.

Sheep Mountain Table is near the western boundary of the South Unit off BIA Route 27, south of SD 44. Sheep Mountain can be reached by traveling a gravel-surfaced road about 6 miles long. The first 3.5 miles of the road are relatively flat; then the road ascends steeply to the table. Once on the table, the road diminishes into a series of two-track roads. The two-track roads are heavily rutted, and more routes are being created by visitors trying to avoid heavily rutted areas.

Blindman Table is in the northwest corner of the South Unit along BIA 41. Drivers can reach the table via a two-track dirt road about four miles long. However, the first mile of the road crosses private land.

The Badlands Loop Scenic Byway was designated by the state of South Dakota in 2001 and has been proposed for designation as a

federal scenic byway. This scenic byway begins at exit 131 on I-90 at Cactus Flats and travels south and west along the Loop Road to the Pinnacles entrance station.

Availability of Information

Orientation and Information Services. Before visiting Badlands National Park, visitors can obtain information about the park from the NPS Web site (<http://www.nps.gov/badl>), and from travel guides, previous visits, and state or local welcome centers (Simmons and Gramann 2001). A trip planner is available from the park upon request. More information also is available in a rack card at state-operated rest areas along I-90, which are open from April to October each year.

Orientation and information about the South Unit is available at the three staffed entrance stations: Northeast, Interior, and Pinnacles. Visitors can receive orientation, a map, the park newspaper, and safety information at these three entrance stations. Information about the South Unit is also available at the Ben Reifel Visitor Center in the North Unit, as well as at the White River Visitor Center.

Visitor Centers. There is one visitor center in the South Unit, the White River Visitor Center. The White River Visitor Center currently is the only point of contact within the South Unit. Located on the Pine Ridge Reservation on BIS Route 27, the White River Center is operated in the summer only by the OSPRA, and offers a staffed information desk, park orientation movie, exhibits, restrooms, and water. It typically is open June through August. A small picnic area is adjacent to the visitor center. There are no interpretive trails.

Exhibits at the White River Visitor Center — mainly photographs covering Indian history before the 1940s — primarily interpret Lakota culture and history. There are seven exhibit panels and eight mannequins dressed in various Lakota clothing. A 28-minute videotape chronicling the Sioux and their culture is shown, but only six to eight people can view the program in comfort. The newest exhibits were installed in 2006 and 2007. These exhibits are mostly cultural in nature with some paleontology as well.

The White River facility was not designed to be used as a visitor center, and floor space cannot be used to the full capacity. When installed in 1979, this facility had a life expectancy of five years. In 2004, the doublewide trailer was replaced with a modular building.

Range of Enjoyment of Visitor Activity

The South Unit is the least visited area of Badlands National Park, consisting of the Stronghold and Palmer Creek areas. These areas offer a rugged experience for people with a sense of adventure with extensive backcountry experience and self-reliance. Both units contain prehistoric, historic, scenic, scientific, and human resources, and there is evidence of significant archeological resources. However, to get to some places in these units, one must cross private lands.

In addition to typical park visitors, livestock grazers and tribal members use the South Unit. Members of the OST are permitted to hunt in these areas under the 1976 *Memorandum of Agreement*.

The NPS has not encouraged visitors to explore much of the South Unit, because the area was used as a bombing range by the U.S. Air Force during World War II, and still contains unexploded ordnance.

Visitors who explore the South Unit use high-clearance vehicles or come on foot, with pack stock, or on bicycles. Vehicle access in the South Unit is restricted to the few existing two-track roads. Popular activities for visitors are driving the road onto Sheep Mountain and Blindman Tables, which provide expansive overlooks. The White River Visitor Center is the only source of orientation, interpretation, and education in the South Unit until the Lakota Heritage and Education Center is constructed.

Vehicle Use. The South Unit has limited highway access and even less vehicle access to the interior of the unit.

Picnicking. The White River Visitor Center has limited picnicking opportunities available.

Hiking and Pack Stock Use, and Camping. These activities are currently available to the public, but access is limited.

SOCIOECONOMICS

The South Unit is located entirely in Shannon County, South Dakota. Including the North Unit, the whole of Badlands National Park is located in Jackson, Pennington, and Shannon counties, South Dakota. Since economic impacts may occur across a larger region than Shannon County, the study area for the socioeconomic assessment includes the three counties in which the entire Badlands National Park is located. The discussion below provides an overview of social and economic conditions in each of these counties as well as conditions for the OST, where available.

Population Centers

Population centers for each of the study area counties are shown in table 7. At the time of the 2000 Census, Rapid City in Pennington County has just less than 60,000 residents – a population center significantly larger than in either of the most populated areas in other study area counties. Pine Ridge in Shannon County – a population center with a relatively high concentration of Oglala Sioux residents – reported having approximately 3,171 residents at the time of the 2000 Census. Population estimates for 2008 as provided by the American Community Survey (a product of the U.S. Census Bureau) indicate that the population of Kadoka in Jackson County has decreased approximately 10.1 percent while the population of Rapid City has increased by approximately 9.9 percent since the 2000 Census.

TABLE 7. POPULATION CENTERS IN STUDY AREA COUNTIES

County	Most Populated Municipality	2000 Census	2008 Estimate	% Change (2000 to June 2008)
Jackson	Kadoka	706	635	-10.1%
Pennington	Rapid City	59,607	65,491	9.9%
Shannon	Pine Ridge	3,171	N/A*	N/A

Source: U.S. Census Bureau 2010; Note: *2008 population estimates are not available for Pine Ridge in Shannon County.

County Summaries

A summary profile for each study area county is provided below. Each profile includes a brief history of the county as well as major industries and economic conditions.

Jackson County. In 2008, the American Community Survey estimated that approximately 2,660 people live in Jackson County. This is a decrease of 9.5 percent or 280 residents from 2000. Because of disclosure issues, there is little employment information available for Jackson County (see Employment section below). However, it is known that the government sector accounts for just less than 30.0 percent of county employment while farming related employment accounts for approximately 18.0 percent of county employment.

Pennington County. In 2008, the American Community Survey estimated the Pennington County population to be approximately 98,845, an increase of 11.3 percent since 2000. In 2008, industry sectors with the greatest share of total county employment include retail trade (13.8 percent) and government services (17.0 percent).

Shannon County. In 2000, the population of Shannon County was 12,556, a number that would increase to an estimated 13,641 by 2008. In 2001, the government sector accounted for approximately 69.9 percent of county employment, this decreased to 65.4 percent in 2008. In 2008, private employment accounted for approximately 29.7 percent of all county jobs, an increase 4.5 percent from 2001.

Oglala Sioux Tribe

The OST government operates under a constitution consistent with the *Indian Reorganization Act* of 1934. The Tribe is governed by an elected body of officials; each official serves a two-year term.

In 1824, 1851, and 1868, the Tribes of the Great Sioux Nation entered into treaties with the United States. These treaties recognized the rights of the Nation to exist as a sovereign government. The Pine Ridge Reservation was originally part of the Great Sioux Reservation, a total land area that was further reduced by the Great Sioux Settlement of 1889. Presently, the Pine Ridge Reservation encompasses more than 70,000 square miles. The majority of residents live in eleven main towns/housing areas.

The people of the Sioux Nation refer to themselves as Lakota or Dakota, which translates into friend or ally. The Oglala Lakota are part of the Titowan Division. After the Battle of Little Big Horn with General Custer and the 7th Cavalry in 1876, many members of the Great Sioux Nation began to disperse to protect themselves.

The population of the OST has been disputed for years, a dispute which affects federal funding for housing programs and other services. In a 2005 study entitled *Pine Ridge Work Force Study*, Dr. Kathleen Pickering identified 28,787 people living on the Pine Ridge Reservation (Pickering 2005). A figure just recently accepted by the U.S. Department of Housing and Urban Development is considered the most accurate count in the last ten years. A 2005 report released by the BIA identified 43,146 enrolled

tribal members, living both on and off the Pine Ridge Reservation.

Pine Ridge Village, which is located in the southwestern corner of the reservation, is the administrative center for the Indian Health Service Unit, the BIA, and Tribal Government and State agencies. Kyle is home of the main campus of Oglala Lakota College; there are several other campuses on the reservation.

A number of different plans have been prepared and implemented to improve economic conditions on the Pine Ridge Reservation. Measures include business development strategies, roadway and infrastructure improvements, tourism development, improving education and health services, and construction of appropriate housing.

Demographic Characteristics

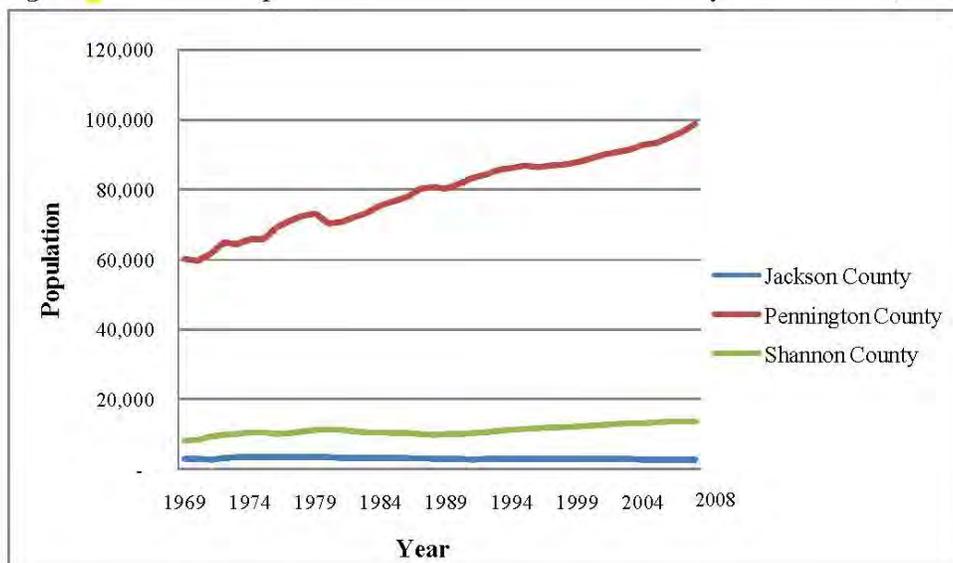
This section describes demographic characteristics for each of the three counties located in the socioeconomic study area. Included below is information on population growth since 1969, age characteristics, and racial and ethnic characteristics. Information specific to the OST is included where available. Data has been retrieved from the U.S. Census Bureau and the BIA.

Population Trends. Population numbers for each study area county for the years 1969 through 2008 were retrieved from the U.S. Department of Commerce, Bureau of Economic Analysis (BEA). As shown in figure 3, Pennington County has grown at a rate considerably faster than either Jackson or Shannon Counties. Over the approximate forty year period, Jackson County experienced a decrease of slightly less than 10.0 percent while Pennington and Shannon Counties experienced population growth of 64.3 percent and 67.5 percent, respectively.

Between 2000 and 2008, Pennington County increased by approximately 10,000 people or 11.3 percent. During the same period, Shannon County increased by approximately 1,085 people or 8.6 percent while Jackson County experienced a decrease of approximately 280 people or -9.5 percent.

The BIA issues a report every few years on population, employment, and poverty levels for tribal populations across the country. The most recent report, entitled the *2005 American Indian Population and Labor Force Report*, identifies approximately 43,146 individuals as part of the OST, an increase of approximately 8.6 percent from 1997.

FIGURE 3. HISTORICAL POPULATION AND CURRENT ESTIMATES FOR STUDY AREA COUNTIES, 1969–2008



Source: BEA 2010

Age Characteristics. The age composition of the three study area counties varies considerably, as shown in table 8. Shannon County reports the greatest percentage of those who identify themselves as being less than 16 years of age. This is notably higher than either Jackson or Pennington Counties, which report approximately 31.8 percent and 23.5 percent of residents who identify themselves the same. The OST and Shannon County overall have a smaller percentage of residents 65 years of age and older than Jackson or Pennington Counties and South Dakota overall.

Racial and Ethnic Characteristics. The presence of the Pine Ridge Reservation in Shannon County has resulted in the racial and ethnic composition of the county to be notably different than either Jackson or Pennington Counties. As demonstrated in table 9, approximately 94.2 percent of Shannon County residents identify themselves as being American Indian or Alaska Native Alone. More than 86.0 percent of Pennington County residents identify themselves as being White Alone as compared to approximately 50.1 percent in Jackson County. Of study area counties, the racial and ethnic composition of Pennington County most closely resembles that of South Dakota overall. In each of the three study area counties, there are very few residents who identify themselves as being Black or African American, Asian, or some other race.

Economic Characteristics

The following provides an overview of economic conditions in each of the three study area counties as compared to South Dakota and the United States overall. Information for the OST is included where available.

Personal Income

Of the three regional counties, only Jackson County experienced an increase in per capita income between 2000 and 2008. In 2008, the per capita income in Jackson County increased approximately \$5,658 or 22.9 percent from 2000. Between 2000 and 2008, Pennington County experienced a per capita income decrease of approximately \$1,638 while Shannon County experienced a decrease of approximately \$492 per person. This decrease is most closely aligned with the change in South Dakota per capita income which decreased approximately \$307 during the same period.

In Shannon County, the per capita income is considerably less than in either Jackson or Pennington Counties (see figure 4). In 2008, the per capita income in Shannon County was approximately \$12,795 less than the per capita income in Jackson County and approximately \$22,563 less than the per capita income in Pennington County. Per capita income in Pennington County is slightly less than the South Dakota average, a number approximately \$1,500 less than the national average. In 2008, the per capita income in Jackson County was approximately \$8,246 less than for South Dakota overall.

TABLE 8. AGE CHARACTERISTICS OF THE OGLALA SIOUX TRIBE, STUDY AREA COUNTIES, AND SOUTH DAKOTA, 2000

Age	Jackson County		Pennington County		Shannon County		Oglala Sioux Tribe*		South Dakota	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Under 16 Years of Age	932	31.8%	20,853	23.5%	5,050	40.5%	15,584	34.5%	177,715	23.5%
16-64 Years Old	1,646	56.2%	57,318	64.7%	6,827	54.8%	26,614	58.9%	469,013	62.1%
65 Years of Over and Over	352	12.0%	10,394	11.7%	589	4.7%	3008	6.7%	108,116	14.3%
Total	2,930	100.0%	88,565	100.0%	12,466	100.0%	45,206	100.0%	754,844	100.0%

Source: U.S. Census Bureau. SF3 data tables. Department of the Interior, BIA.

Note: *Population numbers for the OST are from 2001.

TABLE 9. RACIAL AND ETHNIC COMPOSITION FOR STUDY AREA COUNTIES, 2000

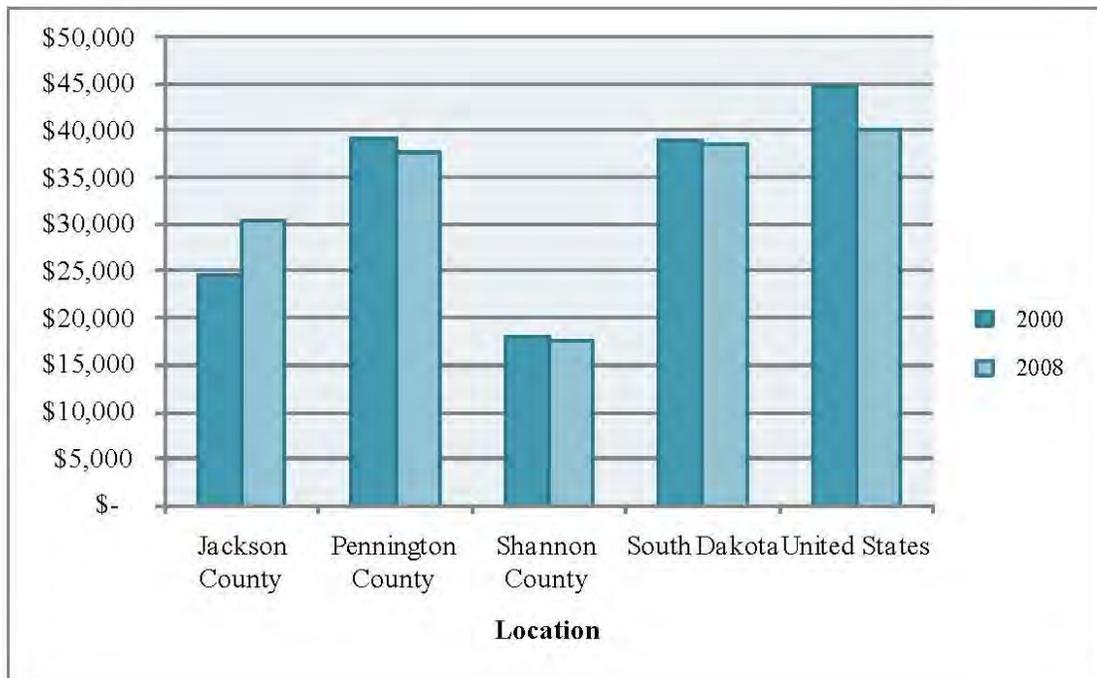
Race and Ethnicity	Jackson County		Pennington County		Shannon County		South Dakota	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
White Alone	1,467	50.1%	76,789	86.7%	562	4.5%	669,404	88.7%
Non-Hispanic White	1,465	99.9%	75,797	98.7%	554	98.6%	664,585	99.3%
Hispanic White	2	0.1%	992	1.3%	8	1.4%	4,819	0.7%
Black or African American Alone	1	0.0%	755	0.9%	10	0.1%	4,685	0.6%
American Indian and Alaska Native Alone	1,402	47.8%	7,162	8.1%	11,743	94.2%	62,283	8.3%
Asian Alone	1	0.0%	776	0.9%	3	0.0%	4,378	0.6%
Other*	59	2.0%	3,083	3.5%	148	1.2%	13,833	1.8%
TOTAL	2,930	100.0%	88,565	100.0%	12,466	100.0%	754,583	100.0%
Minority**	1,465	50.0%	12,768	14.4%	11,912	95.6%	89,998	11.9%

Source: U.S. Census of Population and Housing. SF1 data tables.

Notes: *The Other category includes those individuals who identify themselves as being of some other race alone or two or more races.

**The total minority population includes all those who have classified themselves as Black or African American, Hispanic White, American Indian or Alaska Native, Asian, Other Pacific Islander and Other.

FIGURE 4. 2000 AND 2008 PER CAPITA INCOME FOR STUDY AREA COUNTIES, SOUTH DAKOTA, AND THE UNITED STATES (IN 2008 DOLLARS)



Source: BEA 2010

Badlands National Park. The *2008 National Park Visitor Spending and Payroll Impacts* report prepared by the Department of Community, Agriculture, Recreation and Resource Studies at Michigan State University, summarizes employment, spending and economic impacts of national parks across the country. The report indicates that approximately \$3.4 million in salaries were earned by the 80 people employed at Badlands National Park during fiscal year (FY) 2008. The average annual salary of these employees was \$42,725, a per capita income higher than in study area counties. Jobs indirectly supported by park payroll and associated spending resulted in 107 jobs with a total income of approximately \$5.0 million. The average annual salary of such individuals was estimated at \$46,785.

Employment by Industry

Data was obtained from the BEA on total annual employment for study area counties from 2001 and 2008. This information can be used to understand employment trends as well as current industry employment figures¹.

The following section describes employment trends in terms of the number and percentage of jobs gained or lost in each industry sector over the seven year period as well as the percentage of industry jobs in 2008 as a percent of total employment. Employment by industry is not yet available for 2009. However, it is anticipated

that employment numbers have been affected by the recent nationwide recession.

Jackson County. The small number of businesses operating in Jackson County has resulted in the majority of employment information to be nondisclosed. In both 2001 and 2008, there were approximately 1,350 jobs in Jackson County. Just less than 30.0 percent of jobs are associated with federal, state, and local government services. In 2001, approximately 352 or 25.6 percent of total employment was related to farming activities. This decreased to 20.0 percent by 2008. In both 2001 and 2008, employment in the retail trade sector accounted for approximately 12.8 percent and 11.9 percent of total employment, respectively.

Pennington County. The number of jobs in Pennington County increased by approximately 8.9 percent between 2001 and 2008. In both 2001 and 2008, the largest single employment sector was government and government enterprises which accounted for approximately 17.0 percent of total employment in the county. The second largest employment sector was retail trade which constituted approximately 13.5 percent of total county jobs in both 2001 and 2008. In 2001, the manufacturing sector employed approximately 4,148 people or 7.1 percent of the total labor force. This decreased by approximately 1,164 employees or 27.5 percent in 2008. Industry sectors that experienced notable growth during this period include utilities, management of companies and enterprises, and professional, scientific, and technical services.

Shannon County. There is little employment information available for Shannon County. In 2001, there were approximately 4,679 people employed in Shannon County. This increased slightly to 4,833 in 2008. The largest employment sector is government and government enterprises, which in 2001, accounted for approximately 69.9 percent of all county jobs. This industry decreased to 65.4 percent in 2008. In 2008, farming activities employed approximately 237 people.

¹ U.S. Department of Commerce, Bureau of Economic Analysis. Bureau of Economic Analysis (BEA) estimates annual employment for counties nationwide. Data can be incomplete in some counties due to disclosure issues associated in areas where few firms are operating. Estimates of total employment, however, do include those numbers that are unreported or omitted at the specific industry level.

Total annual employment includes both part-time and full-time jobs. Therefore, individuals having more than one job are counted twice in the totals. The employment estimates include those individuals who are employed by business and public entities, as well as those who are self-employed. Since 2001, the BEA has employed the North American Industry Classification System to better capture new industries that did not exist under the previous Standard Industrial Classification System (SICS).

Badlands National Park. The operation of Badlands National Park brings jobs and spending to the larger region. Currently, a large part of visitor patronage to the park occurs in the North Unit. As a result, much but not all of the employment and economic activity supported by such visitor patronage is experienced in areas within close proximity to the North Unit. As mentioned in the Visitor Experience section, there were approximately 845,734 visitors to the park in 2008 (this includes both the North and South Units). The following provides an overview the jobs and spending generated by such patronage.

The *2008 National Park Visitor Spending and Payroll* summarizes spending and economic impacts of national parks across the country. Visitor patronage to the park matriculated in 32,597 overnight stays in the area. Such overnight visits as well as other local spending generated approximately \$20.3 million in visitor spending in calendar year 2008. Economic impacts of non-local visitor spending in the area generated approximately 436 jobs, \$6.9 in local incomes, and \$11.0 million in value added to local markets. Visitor spending as well as the \$2.2 million in payroll spending by park employees in local markets generated approximately \$22.5 million in sales during calendar year 2008. Employment supported by visitor patronage coupled with jobs induced by employment at the park resulted in 544 total jobs in calendar year 2008.

Unemployment

Annual unemployment rates from 2001 to 2009 for each of the study area counties, South Dakota, and the United States have been retrieved from the Bureau of Labor Statistics. As shown in figure 5, Shannon County has consistently had unemployment rates higher than Jackson or Pennington Counties, South Dakota and the United States (BEA 2010c).

Unemployment rates in Pennington County most closely resemble unemployment rates for South Dakota as a whole. During the time series shown in figure 5, South Dakota has consistently had an unemployment rate notably lower than the

United States overall, and particularly since the nationwide recession began in 2008.

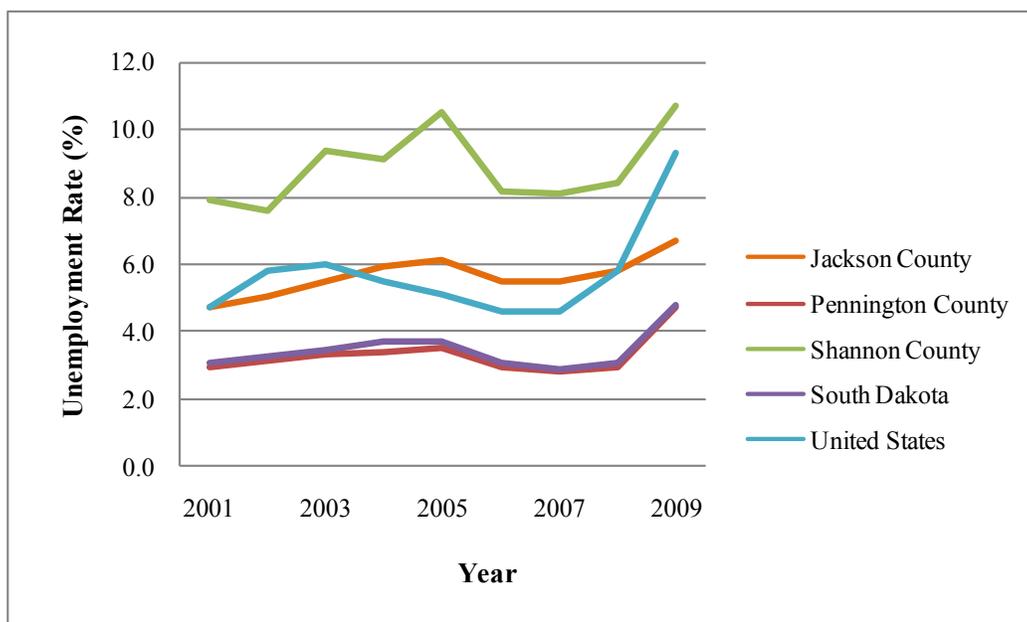
Unemployment rates among the Oglala Sioux, as reported by the BIA, are significantly higher than study area counties, South Dakota, and the United States. In 1997, unemployment among the Oglala Sioux was approximately 72.9 percent, a rate that would continue to increase in the coming years. Just two years later, in 1999, the unemployment rate had increased to approximately 85.0 percent. In 2005, the most current year for which information is available, reported an unemployment rate of approximately 89.4 percent.

Poverty Rates

The numbers presented in table 10 were retrieved from the 2000 Census and Small Area Income and Poverty Estimates prepared by the U.S. Census Bureau. As shown in table 10, the percentage of those living below the poverty line in Shannon and Jackson Counties is considerably higher than in Pennington County, South Dakota, or United States. At the time of the 2000 Census, more than 50.0 percent of Shannon County residents reported living below the poverty line. Current estimates for 2008 anticipate that the percentage of those living below the poverty line in Shannon County has decreased since the 2000 Census. Between 2000 and 2008, the most significant change of those living below the poverty line was in Pennington County, which experienced an increase of approximately 1.6 percent of those living below the poverty line.

The BIA also reports on the number and percentage of employed individuals living below the poverty line. In 1997, approximately 4.0 percent of employed Oglala Sioux members were living below the poverty line, a percentage that would continue to increase at a relatively fast pace. In 1999, the percentage of employed Oglala Sioux living below the poverty line increased to 19.0 percent. This increased to approximately 34.0 percent in 2005, the latest year for which information is available.

FIGURE 5. STUDY AREA COUNTIES, SOUTH DAKOTA, AND UNITED STATES UNEMPLOYMENT RATES, 2001–2009



Source: U.S. Department of Labor, Bureau of Labor Statistics 2010

TABLE 10. POVERTY AND MEDIAN HOUSEHOLD INCOME, 2000 AND 2008

Geographic Area	Persons Living Below the Poverty Line					Median Household Income (in 2008 Dollars)		
	2000		2008		% Change (2000 to 2008)	2000	2008	% Change (2000 to 2008)
	Number	Percent	Number	Percent				
Jackson County	1,053	36.5%	868	32.6%	3.9%	\$35,293	\$28,119	-20.3%
Pennington County	9,967	11.5%	12,987	13.1%	-1.6%	\$55,250	\$46,887	-15.1%
Shannon County	6,385	52.3%	6,175	45.3%	7.1%	\$30,829	\$25,867	-16.1%
South Dakota	95,900	13.2%	98,248	12.2%	1.0%	\$52,003	\$46,244	-11.1%
United States	33,899,812	12.4%	39,108,422	13.2%	-0.8%	\$61,896	\$52,029	-15.9%

Source: U.S. Census Bureau. SF3 Data Tables. Small Area Income and Poverty Estimates. U.S. Census Bureau 2010

High unemployment and poverty levels coupled with low per capita income in Shannon County have matriculated into a comparatively low average median household income. Information from the 2000 census and 2008 estimates reveal that the average median household income in Shannon County is notably lower than in either Jackson or Pennington Counties. In 2008, the average median household income in Shannon County was approximately \$20,000 less than the average median household income in Pennington County.

Between 2000 and 2008, the average median household income in each of the three study area counties as well as South Dakota and the United States decreased. Each of the three study area counties experienced a percentage decrease in average median household income higher than the South Dakota average. Jackson County experienced the greatest decrease while Pennington and Shannon Counties experienced a decrease similar to the United States overall.

Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was signed by President Clinton on February 11, 1994. This Order requires that all federal agencies incorporate environmental justice into their missions by identifying and addressing any disproportionately high and adverse human health or environmental effects that their programs and policies may have on minorities and low-income populations and communities. The Secretary of the Interior established Department of the Interior policy under this order in a Memorandum dated August 17, 1994, which directs all bureau and office heads to consider the impacts of their actions or inaction on minority and low-income populations and communities, to consider the equity of the distribution of benefits and risks of those decisions, and to ensure meaningful participation by minority and low-income populations in the department's wide range of activities where health and safety are involved.

The Environmental Protection Agency (EPA) defines a community with potential Environmental Justice populations as one that has a greater percentage of minority or low-income populations than does an identified reference community. Minority populations are those populations having (1) 50 percent minority population in the affected area (EPA 1998); or (2) a significantly greater minority population than the reference area. There are no specific thresholds provided for low income or poverty populations. For the purposes of this study, it is assumed that if the study area minority and/or poverty status populations encompass more than ten percentage points higher than those of the reference area, there is likely an Environmental Justice population of concern. The thresholds for poverty levels for an individual and a family of four were income levels of \$8,501 and \$17,029, respectively (U.S. Census 2003).

As mentioned earlier, the South Unit is located entirely in Shannon County. Thus the evaluation of potential environmental justice populations focused on Shannon County and used the State

of South Dakota as a reference community. Following the EPA's criteria for identifying minority environmental justice populations, Shannon County clearly has minority environmental justice populations present as shown in table 9. According to the U.S. Census, approximately 94 percent of Shannon County residents identify themselves as being American Indian or Alaska Native Alone. This is much higher than the 50 percent threshold established by the EPA. In addition, this is a much higher percentage of a minority population than exists throughout South Dakota (approximately 10 percent). In addition, Shannon County also reports a high percentage of individuals that are living below the poverty line. In 2008, it was estimated that over 45 percent of individuals living in Shannon County were living in poverty. This is substantially higher than either the State of South Dakota (12 percent) or the U.S. (13 percent).

Given the presence of environmental justice populations within in study area, the impact analysis will consider if any disproportionate high or adverse impacts would occur to these populations.

Local Resources

This section provides an overview of local resources including land ownership and property valuation within the study area. The discussion identifies primary travel corridors, schools, law enforcement units, and medical facilities. Information specific to the OST has been included where available.

Land Use and Landownership

Land ownership patterns for each study area county are summarized in table 11. The majority of land in Jackson County is privately held or owned by local governments. Such lands include agricultural areas, highways, railroads, and municipal lands. Federally-owned land in Jackson County includes parts of the Badlands National Park and the Buffalo Gap National Grassland, administered by the U.S. Department of Agriculture, Forest Service. Approximately 32.3 percent of Jackson County is tribally owned.

TABLE 11. PERCENT OF LAND OWNERSHIP OF STUDY AREA COUNTIES

County	Land Area (square miles)	Land Area (million acres)	Federal	Private/Local Government	State	Tribal Lands	Public Domain
Jackson	1,864	1.2	10.0%	57.3%	0.4%	32.3%	0.03%
Pennington	2,784	1.8	39.2%	60.7%	0.1%	N/A	N/A
Shannon	2,100	1.3	11.0%	14.0%	0.1%	74.9%	N/A

Source: Fall River/Shannon County Equalization Office. Communication with Brad Stone, Jackson County Assessor on May 4, 2010. Pennington County parcel data provided by Don Jarvinen, Pennington County GIS Department.

More than 60.0 percent of Pennington County parcels are privately owned or owned by local governments (i.e., municipal and county). Less than 1.0 percent of County parcels are state owned while approximately 39.2 percent of parcels are federally owned. Federally owned lands include part or all of the following: Black Hills National Forest; Badlands National Park; Buffalo Gap National Grassland; Minutemen Missile National Historic Site; and Mount Rushmore National Memorial.

The vast majority of Shannon County is tribally owned (75 percent). Federally-owned land in Shannon County is part of the Badlands National Park. There is very little state-owned land in the county.

Property Valuation and Taxation

Local and state government entities generate a portion of their tax revenues by assessing and taxing certain categories of property. This section describes the property tax information for each of the study area counties. Taxable valuations for 2009 are shown in table 12.

The State of South Dakota and its four Indian tribes have entered into tax collection agreements which cover sales, use, and contractors' excise tax. The percentage share of different tax revenues collected in Jackson and

Shannon Counties are similar. In both counties, more than 80.0 percent of tax revenues collected during FY 2009 were the result of agriculture-related activities while less than 3.0 percent of tax revenues in Pennington County were the result of the same such activities. The percentage share of tax revenues generated by commercial and utility properties was significantly higher in Pennington County than either Jackson or Shannon Counties.

On tribal lands that are covered by a tax collection agreement, the state and the respective tribe each have the ability to tax certain individuals and transactions. The state collects all state taxes in the tribal areas as well as collects and remits the taxes in those areas for the respective tribe. During the 2009 fiscal year, the OST paid approximately \$2.5 million in taxes, a slight increase from the approximately \$2.3 paid during FY 2008.

Police Protection and Emergency Services

An increase in visitor patronage to the South Unit has the potential to place additional demand on the delivery of existing police protection and emergency services in the area. This section provides an overview of existing services in the study area.

TABLE 12. TAXABLE VALUATIONS FOR 2009

County	Agriculture	Owner Occupied	Other	Total
Jackson	80.4%	9.5%	10.1%	\$129,524,282
Pennington	2.6%	52.4%	45.0%	\$6,910,844,603
Shannon	80.8%	8.9%	10.4%	\$27,706,379

Source: South Dakota Department of Revenue & Regulation 2010

Note: The "Other" category includes residential property not occupied by the owner, and commercial and utility properties.

As demonstrated in table 13, a total of five police departments and sheriff’s offices providing police protection and law enforcement services are located in the study area. As the most populous of study area counties, Pennington County has the greatest number of law enforcement units.

In addition to county police protection, residents, employees, and visitors are also protected by the South Dakota Department of Public Safety, the state law enforcement agency with statewide jurisdiction. The Department of Public Safety works closely with the South Dakota Highway Patrol, a division of the Department of Public Safety, and the South Dakota Fire Marshal. The NPS also provides law enforcement within the park.

In addition to county and state police protection and law enforcement, the OST established a Tribal Department of Public Safety. The department provides law enforcement services that are guided by cultural beliefs and traditions. It is tribally chartered professional law enforcement agency that serves the people of the Pine Ridge Reservation. The mission of the department is twofold. The first objective is to prevent outside interests from encroaching upon the sovereign status of the Tribe, and the second is to help maintain peace and social order among the people living on the Pine Ridge Reservation. The department pursues its mission by enforcing tribal and federal law, upholding the Constitution and By Laws of the OST, and carrying out the lawful decisions of the various branches of tribal government – the OST

Council, the Oglala Sioux Tribal President, and the OST Courts (OST, Department of Public Safety 2010).

There are 31 professional and volunteer-run fire stations located in the study area. There are a total of 641 paid and volunteer firefighters at these locations (see table 14). Again Pennington County, as the most populated of study area counties, also has the greatest number of fire stations and personnel. Fire stations operated in both Jackson and Shannon Counties are run by volunteer firefighters and other personnel.

The population per emergency service personnel is calculated by dividing 2008 County population estimates by the number of firefighting personnel in each county. Since the U.S. Fire Administration continuously updates the National Fire Department Census, it was appropriate to use 2008 population estimates provided by the American Community Survey rather than 2000 Census information for this calculation. Of study area counties, Shannon County has the highest number of residents for every one emergency service personnel (390 residents for every 1 emergency service personnel). This is considerably higher than either Jackson or Pennington Counties. Jackson County has the fewest residents per emergency service personnel (20 residents for every one emergency service personnel).

There are five hospitals and emergency medical centers located in the study area (see table 15). Pennington County has four such facilities while Jackson County currently does not have any hospitals or emergency medical centers.

TABLE 13. POLICE PROTECTION IN STUDY AREA COUNTIES

County	Unit
Jackson	Jackson County Sheriff’s Office
Pennington	Pennington County Sheriff’s Office
	Box Elder Police Department
	Rapid City Police Department
Shannon	Shannon County Sheriff’s Office

Source: USACOPS 2010

TABLE 14. FIREFIGHTING SERVICES LOCATED IN STUDY AREA COUNTIES

County	Number of Fire Stations	Personnel	2008 Population Estimates	Population per Emergency Service Personnel	Type
Jackson	5	130	2,660	20	Volunteer
Pennington	25	476	98,845	208	Career, Mostly Volunteer, and Volunteer
Shannon	1	35	13,641	390	Volunteer

Source: National Fire Department Census, U.S. Fire Administration 2010

TABLE 15. HOSPITALS AND MEDICAL CENTERS LOCATED IN STUDY AREA COUNTIES

County	Number of Hospitals/Medical Centers	Number of Patient Beds	2008 Population Estimates	Population per Available Patient Bed
Jackson	0	0	2,660	N/A
Pennington	4	488	98,845	203
Shannon	1	58	13,641	235

Source: U.S. Department of Health and Human Services 2010

Since the U.S. Department of Health and Human Services continuously updates its Health Resources and Service Administration Geospatial Data Warehouse – Report Tool, it was appropriate to use 2008 population estimates provided by the American Community Survey rather than 2000 Census information to determine number of residents per available bed. As shown in table 15, based on 2008 population estimates, Shannon County has the greatest number of residents per available bed (235 residents per available bed). Pennington County has slightly less residents per available bed (203 residents per available bed).

In addition to hospitals located within the study area, there are three rural health clinics – two located in Pennington County and the other in Jackson County.

Parts of both Jackson and Pennington Counties and all of Shannon County have been designated as medically underserved areas². Residents from these counties must travel to neighboring areas

² Medically Underserved Areas/Populations are areas or populations designated by the Health Resources and Services Administration of the U.S. Department of Health and Human Services as having too few primary care providers, high infant mortality, high poverty and/or high elderly population.

or counties to receive the medical attention they need.

PARK OPERATIONS

One of the major factors directly influencing operations in the South Unit as well as certain management operations in the North Unit is embodied in the Public Law (PL) 90-468 and the Memorandum of Agreement (MOA) between the OST of South Dakota and the NPS. Public Law 90-468 authorized the addition of tribal lands, here after referred to as the South Unit, to the existing Badlands National Park. Based on the public law, these lands are being held by the United States in trust for the Tribe and the NPS was authorized administrative jurisdiction of the lands pursuant to the special provisions identified in the public law and in accordance with applicable laws and Department of the Interior regulations.

The Memorandum of Agreement recognized the additions of the South Unit to the Badlands National Park and detailed more specific conditions. The agreement further granted the right of administration to the NPS solely for the purpose of providing public recreation and for the development and administration of public

use facilities which are also subject to the terms and conditions identified in the Memorandum of Agreement. The OST and the NPS agreed that the NPS would provide for the care, maintenance, preservation, and restoration of features of prehistoric, historic, scientific, or scenic interest and to develop roads, trails or other structures or improvements as may necessary in connection with the administration, visitor use, and protection of the South Unit. The Memorandum of Agreement stipulated that the NPS and the OST to work toward the objective of having members of the OST fill all Service positions in the South Unit. To achieve this end, the NPS is responsible for encouraging and assisting tribal members to train and qualify for all positions in the South Unit as well as the North Unit. Under the terms and conditions of the agreement the OST is entitled to 50 percent of the fees charged for vehicles entering the park and the OST is responsible for 50 percent of the direct cost (i.e., salaries, and other cost directly attributed to fee collection) of collecting the entrance fees.

As for parkwide operations, Badlands National Park operates on an annual budget of approximately \$4.6 million and supports a staff of 47 full-time employees which is supplemented with seasonal staff, volunteers, and the Badlands Historic Association. The staff is organized into six divisions: Resource Management, Resource Protection, Resource Education, Maintenance, Administration, and Management. The Resource Management Division includes inventory, monitoring, planning, and restoration of natural and cultural resources throughout the park. The Resource Protection Division collects fees, provides search and rescue, and provides law enforcement. The Resource Education Division operates the visitor center and provides information, orientation, and interpretation parkwide. The Maintenance Division is responsible for maintaining all, roads, parking areas, overlooks, campgrounds, trails, trailheads, utilities, signs, and buildings (i.e., entrance stations, visitor center, residences, restrooms, etc.). The Administrative Division manages human resources, payroll, procurement, and information technology. The Management

Division is responsible for overall management and direction of the park by providing oversight for each the previously listed divisions to ensure that the goals and objectives of the park are being met.

Approximately 95 percent or more of the facilities that accommodate visitor use and administration of the park are located in the North Unit of Badland National Park. This is primarily due to its location in relation to I-90 which is a major East/West route to national parks such as Yellowstone National Park, Grand Teton National Park, Glacier National Park, and others. Due to the distances people travel from more populated areas of the country and due to limited time, the North Unit is often a quick side trip in the push to reach the more iconic parks. Such trends in visitation have resulted in minimal visitation to the South Unit, which is the most remote area of Badland National Park. Considering the extremely low visitation rates in the South Unit due to visitor use trends, the extremely limited funding levels, and the constant demands to keep facilities and services at a safe and acceptable level, very little funding and staff has been available to manage the South Unit. For fiscal year 2010, the park is devoting approximately \$166,000 to cover the annual operating costs for the South Unit. This includes the cost of two full-time employees and their overhead for operating the White River Visitor Center. This amount is a portion of the park's \$4.6 million annual operating cost.

Badlands National Park can compete with other national park units for various funding sources. These include construction of new facilities, major repair and rehabilitation of facilities, historic preservation projects, resource management, inventory and monitoring programs, and various levels of planning. Levels of funding for these programs are flat or declining. Fees are collected at three entrance stations in the park during busier spring, summer, and fall months and at the visitor center during the rest of the year. The entrance stations are located at the Interior, Pinnacles, and the Northeast entrances. Currently fees are not collected anywhere in the South Unit. Under the Recreation Fee demonstration program established by Congress, 80 percent of the

revenue is available to the park for certain types of projects, and the remaining 20 percent of the revenue is used agency-wide. The 80 percent of the fees retained by the park are divided between the park and the Tribe. Those retained by the park are to be primarily dedicated to address the growing repair and maintenance priority needs (including projects related to health and safety) and the interpretation, signage, habitat, facility improvements, and natural and cultural resources preservation projects. With visitation levels fairly constant, this source of revenue is not increasing. This program is not permanent, and Congress will decide whether or not to renew it. Park staff is involved in developing proposals and managing projects through these programs.

The Badlands Historical Association is a nonprofit organization with a mission to assist the NPS with scientific, educational, historical, and interpretive activities. Through operation of the bookstore, membership dues, and other fund-raising activities, the association raises money to publish interpretive materials and to help fund NPS activities and projects in the park as well as outreach activities in nearby communities. Volunteers are integral to the operation of the

park. The park has been fortunate in drawing highly skilled people willing to donate their time and expertise.

Partnerships are another important element in the management of the park. For example, the NPS has concurrent jurisdiction with the State of South Dakota, which allows the NPS to enforce federal criminal statutes and also to assimilate State law under 18 USC 13, when no applicable federal law or regulation exists. Concurrent jurisdiction also allows for the more efficient conduct of both state and federal law enforcement functions within the park.

Like many national parks servicewide, in real dollars adjusted for inflation, the annual operating budget for the park has been declining. At the same time, there have been increasing demands on staff time, such as partnership initiatives, more volunteer coordination, homeland security (park staff can be detailed to other sensitive areas for lengthy periods), risk management, wildland fire fighting (park staff are shared throughout the country), and unfunded mandates.

IMPACT TOPICS CONSIDERED BUT NOT ANALYZED IN DETAIL

Several potential impact topics were dismissed because the potential for impacts under any of the alternatives would be negligible. These topics are listed below, with an explanation of why they were not considered in detail.

NATURAL RESOURCES

Special Status Species – Threatened, Endangered, or Candidate Species. Several state-listed and federally listed species are known to exist in and around Badlands National Park and use habitats in the park. The USFWS determined black-footed ferret, whooping crane, and western prairie fringed orchid can be found in the three counties that encompass the park (Appendix E: USFWS letter of consultation). The state of South Dakota lists sturgeon chub, bald eagle, peregrine falcon, whooping crane, black-footed ferret, and swift fox as threatened or endangered species. Most of these species occupy the park in limited numbers and would not be affected by this plan. The following provides brief descriptions of each:

The proposed alternatives have no impact because the listed species are either not present or unknown/unlikely to occur with the South Unit.

Water Resources. Surface water is scarce in the South Unit. Water that does occur in the park is usually ephemeral, occurring after storms and spring melt, and is not potable due to naturally occurring dissolved minerals and very fine sediment. Water quality is believed to vary seasonally and from stream to stream, although the causes of these fluctuations are unknown (Black & Vetch 1998). The actions proposed in the alternatives would not be in the vicinity of surface water, or would be built to avoid areas with sensitive water resources. The application of mitigation measures and best management practices, such as the use of silt fences and erosion-control materials, would reduce the potential for water quality impacts. No long-term adverse impacts on water quality would be expected as a result of the alternatives being considered; consequently, water quality was dismissed as an impact topic.

Floodplains. The South Unit has relatively few perennial drainages and, thus, few floodplains. A portion of the South Unit contains the regulatory 100-year floodplain of the White River, but none of the developments proposed in the alternatives would fall within the 100-year floodplain. The ranger residence is partially in the 100-year floodplain, but is not subject to extreme depths or high velocity floodwaters. In the event of a 500-year flood, the area of the garage would be in two to three feet of water. The concern here is fuel storage, which is a “critical action” subject to 500-year floodplain compliance. Either the fuel should be stored above that elevation, or the building should be protected to that level with a ring dike or levee. In accordance with Executive Order 11988, “Floodplain Management,” and NPS guidelines for implementing the Order, this situation is discussed in more detail in the “Statement of Findings” in appendix F. The NPS has determined that retaining the visitor facility, residence, and garage marginally in the 100-year floodplain of the White River is the most practical option. This determination was made based on the low likelihood of risk to visitors and staff from retaining the structures, the possibility of mitigating damage by adding a berm, dike, or levee around the structures, and the minimal effect of the facilities on the floodway and groundwater recharge.

Wetlands. Wetlands are rare in the Badlands because of the topography and low precipitation. Most wetlands are along or adjacent to rivers, streams, seeps, springs, old stock ponds, and ephemeral washes. Riparian woodlands within the floodplain of the White River, riparian shrub lands, and riparian/wet meadows all can be considered wetlands. The park also has artificial wetlands that developed near human-made ponds and dugouts. However, none of the developments in any alternative would be built in wetland areas.

Prime and Unique Farmland. According to the Natural Resources Conservation Service, U.S. Department of Agriculture, there are no prime or unique agricultural soils in Badlands National Park (Shurtliff, pers. comm., 2002). Therefore,

this impact topic was not carried forward for analysis.

Geologic Features and Processes. The South Unit is located in the Great Plains Physiographic Province in southwestern South Dakota. Elevations range from 2,460 feet (along streams) to 3,280 feet (on tablelands). Rivers flowing from the Black Hills carried sediment into the region and created the unique layers seen in the Badlands today. The Badlands strata record approximately 75 million years of earth history, containing both marine and terrestrial deposits. Processes including weathering, mass wasting and erosion formed the modern landscape, creating the distinctive badlands topography and landforms and expose the fossils that are visible today (NPS 2008a).

Some of the distinctive land forms include spires, pinnacles, hoodoos, monuments, buttes, and mesas, collectively known as the White River Badlands. These landforms are controlled by the characteristics of the rocks themselves (NPS 2008a). The Chadron Formation forms grey rounded mounds resembling haystacks. The rugged peaks and canyons are found in the Brule and Sharps Formations. These formations are silty, ash-rich sediments more resistant to erosion than the clay-rich Chadron strata.

The drainage networks of the White River, Cheyenne River and Bad River carry sediment away from the region. The White River cut a broad valley about 500,000 years ago and erosion began to carve the serrated badlands topography. Closely spaced tributaries flowing down the valley caused the valley sides to erode and migrate as a line of cliffs. This long, narrow spine of buttes is known as the “Badlands Wall.” The wall is just one of prominent geologic features that welcome visitors to the park every year.

Potential impacts to minerals and soils associated with the alternatives have minor or less, short-term impacts associated with construction activities.

Air Quality. Badlands National Park is considered a class I air quality area as defined in the *Clean Air Act* of 1977. A class I designation affords the greatest level of air quality protection

provided under the *Clean Air Act*. Only minimal deterioration of air quality is allowed under this designation. There are three air quality monitoring stations in operation at Badlands National Park. Two of these stations, the Badlands and Park Headquarters sites in the North Unit, have collected data on gases, meteorology and visibility since 1987. The Badlands site ceased monitoring in 2006 while the Park Headquarters site currently only monitors for visibility. A third station, the White River Visitor Center site, has monitored for gases, meteorology and particulates since 1997 and currently monitors for only gases (nitric oxide, nitrogen dioxide, oxides of nitrogen and sulfur dioxide) and particulates (PM10 and PM 2.5) (NPS 2010a).

The air quality in Badlands National Park is generally good. The amount of haze and other pollutants that affect the park’s airshed depends on several factors, including the speed and direction of winds, the season, and the time of day. Visibility at Badlands sometimes is affected by haziness caused by fine particulates and gases. Historically, changes in weather patterns, winds, and smoke from fires have affected visibility in the area. Photography was used to monitor visibility from 1987 through 1995. The photographs indicate that on a clear day one often can see from a point in the park for 199 to 236 miles (320–380 km), whereas on a hazy day views can typically decline to only 37 to 50 miles (60–80 km). On an “average” day the visual range in the park is typically 62 to 81 miles (100–130 km) (NPS 1998). Interestingly, it is believed that pre-settlement visibility was lower than current levels because of frequent fires in the area in summer (NPS 1998). More recently, long-term visibility trends were calculated for park visibility monitors with at least 10 years of data (NPS 2009c). Results indicated a statistically significant trend toward improving visibility at Badlands. Despite this general improvement, however, future emissions of air pollutants could be increased by new developments currently under consideration in the region, including several new coal-fired power plants, coalbed methane production, oil and gas production facilities, and railroads (NPS 2006a). If these plans are carried out, some

pollutants would be blown into Badlands by the wind.

WILDERNESS VALUES

There is no designated wilderness in the South Unit, and none is being proposed in this document. Therefore, this impact topic was not carried forward for analysis.

CLIMATE CHANGE

The South Unit is located in a geographic area that is subject to long periods of drought. Although climate change may exacerbate drought conditions, there are no projects anticipated in any of the alternative that would be likely to involve actions that would produce a significant amount of greenhouse gas emissions or could be meaningfully connected to significant climate change effects.

CULTURAL RESOURCES

Historic Structures. There are no known historic structures formally recorded in the South Unit. Therefore, historic structures were considered but not analyzed in detail.

Cultural Landscapes. The landscapes of the South Unit are likely to be considered an ethnographic resource and will be considered in the ethnographic resources section of the —Affected Environment” and —Environmental Consequences.”

INDIAN TRUST RESOURCES

The South Unit is held in trust for the OST by the federal government, meeting the definition of an Indian trust resource. Secretarial Order 3175 requires that any anticipated impacts on Indian trust resources from a proposed project or action by agencies of the Department of the Interior be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. There would not be any adverse impact on the trust status of the South Unit land, and no adverse impacts are likely to occur to trust resources in the South Unit. Therefore, this impact topic was not carried forward for analysis.

NATURAL OR DEPLETABLE RESOURCE REQUIREMENTS AND CONSERVATION POTENTIAL

None of the alternatives being considered would result in the extraction of resources from the park. Under all alternatives, ecological principles would be applied to ensure that the park’s natural resources would not be impaired.

CHAPTER 5: Environmental Consequences

INTRODUCTION

The *National Environmental Policy Act* of 1969 (40 CFR 1500–1508) (NEPA) mandates that environmental impact statements disclose the environmental effects of a proposed federal action. In this case, the proposed federal action is the adoption of the *South Unit General Management Plan / Environmental Impact Statement* (South Unit GMP/EIS). The alternatives in this plan provide broad management direction for the park. Thus, this environmental impact statement should be considered a programmatic document. Before undertaking specific actions to implement the approved plan, National Park Service (NPS) and/or the Oglala Sioux Tribe (OST) will need to determine if more detailed environmental documents must be prepared, consistent with the provisions of NEPA.

The first two parts cover policy and terminology related to cumulative impacts and impairment of resources at the South Unit of Badlands National Park (South Unit). The third part discusses the relationship of the impact analyses to requirements of Section 106 of the *National Historic Preservation Act*. The next part of this chapter discusses terms and assumptions used in the discussions of impacts. Finally, the impacts of the alternatives are analyzed in this order: alternative A (the No-Action Alternative); alternative B (expand interpretive opportunities); alternative C (focus on resource protection/preservation); and alternative D, the preferred alternative (protect resources while expanding interpretive experience). Each impact topic includes a description of the impacts of the alternative, a discussion of cumulative effects, and a conclusion. At the end of the discussion for each alternative there is a required brief discussion of unavoidable adverse impacts, irreversible and irretrievable commitments of resources, and effects on short-term uses and long-term productivity.

CUMULATIVE IMPACTS

Council on Environmental Quality regulations, which implement NEPA, require assessment of

cumulative impacts in the decision-making process for federal projects. Cumulative impacts result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of who undertakes such other actions. Cumulative impacts can result from individually minor but collectively important actions taking place over a period of time.

Cumulative impacts are considered for both the no-action and the action alternatives. These impacts were determined by combining the impacts of the alternatives proposed in this document with the impacts of other past, present, and reasonably foreseeable future actions. To do this, it was necessary to identify other such projects or actions at the South Unit and in the surrounding area. For the purposes of most impact topics in this analysis, the cumulative impact analysis area was the 15-mile area surrounding Badlands National Park, including 15 miles south and east of the Palmer Creek Unit. This cumulative impacts area includes the communities of Interior, Wall, Quinn, Scenic, Red Shirt, Kyle and Sharps Corner. The area includes the North Unit of Badlands National Park, parts of Buffalo Gap National Grassland, and the Pine Ridge Indian Reservation, and parts of Jackson, Pennington, Custer and Shannon counties. The time horizon for the cumulative impacts analysis depends on the impact topic under consideration but in most cases was plus or minus five years.

The following sections outline ongoing projects or projects planned for the near future were identified for the purposes of conducting the cumulative effects analysis (see the —Ongoing NPS Projects and Projects Planned for the Near Future” section in —Chapter 1: Purpose of and Need for the Plan” for more information on these actions).

Actions and Projects Inside the South Unit

The primary projects and actions that could contribute to cumulative effects are summarized

below. These include ongoing and planned actions and projects in the park, reservation, communities, and adjacent counties.

Bombing Range

The cleanup of the Bombing Range located on the Pine Ridge Indian Reservation is an ongoing effort by the U.S. Army Corps of Engineers (USACE) and the OST to identify and mitigate public safety concerns relating to the former military use of these lands. The Bombing Range was divided in twenty-eight sectors to facilitate the characterization of ordnance and explosives concentrations, identify safety problems, and study risk management alternatives. A vast majority of the South Unit is located within the Bombing Range. The areas cleared to date include pieces on top of Cuny Table (Engelbart, pers. comm., 2010). The South Unit will probably never be cleared of unexploded ordnance with today's technology, but some of the more used and passable roads within the South Unit should be cleared in the next few years pending available funding and right of entry from the OST (Engelbart, pers. comm., 2010). The USACE recommended the implementation of institutional controls for the entire former Bombing Range. Institutional controls include elements that inform the public of the sites former use and the potential for unexploded ordnance. Primary populations affected by the former Bombing Range include members of the OST who work, live and use the land for ranching or recreation and visitors to the Pine Ridge Indian Reservation and Badlands National Park.

Actions and Projects Outside of the South Unit

2006 North Unit General Management Plan

The *2006 North Unit General Management Plan* was developed to provide general future guidance and direction for the management of the North Unit of Badlands National Park for the next 15 to 20 years. The plan provides a framework for making decisions about ways to ensure the preservation of natural and cultural resources and provide for a high-quality visitor

experience in the North Unit of the park. The completed plan will establish a basis for decision making in accordance with defined long-term goals. The *2006 North Unit General Management Plan* provides broad direction for resource management and visitor experiences and in most cases does not propose specific actions.

Prairie Dog Management Plan

The *Black-tailed Prairie Dog Management Plan* was completed for the North Unit in 2007. The principal objectives of the management plan are to ensure that the black-tailed prairie dog is maintained in its role as a keystone species in the mixed-grass prairie ecosystem on the North Unit, while providing strategies to effectively manage instances of prairie dog encroachment onto adjacent private lands (NPS 2007b). Plague was detected in the North Unit black-tailed prairie dog population for the first time in 2009. Deltamethrin dusting efforts have been ongoing in the North Unit to protect existing populations of black-tailed prairie dogs, as well as black-footed ferrets (NPS 2009b).

Air Tour Management Plan

Officially established in 2000, the NPS Natural Sounds Program provides park managers with technical assistance and national policy development and guidance for a consistent approach to managing acoustic environments. In 2006, the Natural Sounds Program assisted 39 parks with data collection and analysis, monitoring, and planning. Developing soundscape goals, objectives, and standards and identifying appropriate measures for mitigating noise impacts are part of the planning process. Badlands National Park is one of five parks currently developing an air tour management program.

Fire Management Plan

Badlands National Park Fire Management Plan was established in 2004. This plan is a detailed program of action, providing specific guidance and procedures for accomplishing park fire management objectives. The plan defines levels of protection necessary to ensure safety and

protection of facilities and resources; minimizes undesirable environmental impacts of fire management, and defines levels of fire use to restore and perpetuate natural processes given current understanding of the complex relationships in natural ecosystems.

The South Unit is included in the “Boundary Unit” of the *Badlands National Park Fire Management Plan*.

Buffalo Gap National Grassland (Nebraska National Forest and Grasslands) Land and Resource Management Plan

In 2009, the U.S. Forest Service prepared an update to the 2005 *Nebraska National Forest Land and Resource Management Plan* to provide overall management direction for the National Forest, including the Buffalo Gap National Grassland. This Land and Resource Management Plan offers guidance for all resource management activities on the Nebraska National Forest. It suggests management standards and guidelines, it describes resource management practices, levels of resource production, user capacities, and the availability and suitability of lands for resource management (www.usda.fs.gov). The plan was updated to reflect changes in acreage and priorities.

The plan calls for several objectives and/or standards within the Wall Ranger District that could affect the South Unit, including the following:

- The recommendation of Indian Creek as a wilderness area and the development of primitive campground/trailhead and hiking/horseback trails in Indian Creek Wilderness Area (based on public interest).
- The management of the southwest part of the Wall District to promote prairie dog expansion (primarily adjacent to the park) and black-footed ferret reintroduction habitat.
- The development of trailhead and hiking/horseback trails in the Rake Creek backcountry nonmotorized area.
- The development of watchable wildlife interpretive trail around Kadoka Lake.
- The development of a primitive campground southwest of Wall as dictated by public interest.
- The recommendation of Red Shirt to be designated as a wilderness area and the recommended development of trailheads and trails near Red Shirt Bridge off Highway 40.

Other actions that may be taken in the grassland in the future that could affect the park are making changes in public access (such as limiting or closing public access in areas adjacent to the park), changing livestock stocking rates, and changing fuel treatments (such as prescribed burning).

Proposed Tony Dean Cheyenne River Valley Conservation Act of 2010

On May 5, 2010, U.S. Senator Tim Johnson (D-SD) introduced the *Tony Dean Cheyenne River Valley Conservation Act of 2010* to include a portion of the Buffalo Gap National Grassland in the National Wilderness Preservation System. This Act has not yet been enacted as a law and still requires Congressional and Presidential approval. The proposed bill is based on an earlier recommendation by the U.S. Forest Service for wilderness protection in the areas of Indian Creek and Red Shirt. The bill includes approximately 48,000 acres within the National Grassland, covering land in the Indian Creek, Red Shirt, and Chalk Hills areas. The act would leave the six-mile long Indian Creek Road open to vehicles by excluding it from the wilderness boundaries. Hunting would continue, as would recreational rock collecting. Johnson named this legislation after the late Tony Dean, a longtime South Dakotan and advocate for hunting and protecting South Dakota’s open spaces (proposed Senate Bill 3310).

Nebraska National Forest Travel Management Plan

A Record of Decision was signed in April 2010 on the *Nebraska National Forest Travel Management Plan Final Environmental Impact*

Statement. The purpose of this action is to improve management of motorized vehicle use on National Forest System lands within the Nebraska National Forest in accordance with regulations at 36 CFR Parts 212, 251, 261, and 295, and as described in *Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule (Federal Register, Vol. 70 No. 216; the 2005 Travel Management Rule, or, the Rule)*. The Record of Decision documents the decision authorized under the U.S. Department of Agriculture Forest Service 2005 Travel Management Rule. The decision implements a motorized vehicle system for the Nebraska National Forest units on the Pine Ridge and Bessey Ranger Districts, the Samuel R. McKelvie National Forest, the Oglala National Grassland, and the Fall River Ranger District portion of the Buffalo Gap National Grassland. The plan decreases the miles of motorized roads, increases the miles of motorized trails, and reduces the number of cross country use areas in order to provide users a variety of experiences. This decision will require an amendment to the *Land and Resource Management Plan* to implement the proposed action.

South Dakota National Guard Training Sites (2010–2015) Environmental Assessment

An environmental assessment is being prepared for a special use management permit authorizing the South Dakota Army National Guard to use portions of the Buffalo Gap National Grassland as a training site (www.fs.usda.gov – Nebraska National Forest, Schedule of Proposed Action, 3/31/2010).

Proposed Crazy Horse Scenic Byway

The Oglala Sioux Parks and Recreation Authority (OSPRA) is pursuing Federal Highway Administration approval for the 215-mile Crazy Horse Scenic Byway. As described in an article by Tom Katus in the Lakota Country Times on October 13, 2009,

The 215-mile Crazy Horse Scenic Byway will begin at the eastern gates of Interstate 90 at Kadoka (Exit 150) and Cactus Flats (Exit 131) and will

continue through the Badlands, Pine Ridge Indian Reservation and Black Hills, terminating at Crazy Horse Memorial Mountain. The Byway will become the most culturally and naturally relevant interpretive byway in South Dakota and will: Link the Badlands Loop State Scenic Byway, the North and South Units of the Badlands National Park through the Pine Ridge Indian Reservation, Wind Cave National Park, the Wildlife Loop in Custer State Park, the Peter Norbeck National Scenic Byway, Mt. Rushmore National Memorial and the Crazy Horse Memorial Mountain; Double the visitors to the Badlands National Park from approximately 1 million to 2 million annually, within a decade; and encourage positive race relations between the descendants of the 1800s Oglala Lakota and the American settlers, predominantly white but also including African-, Asian- and Hispanic-Americans.

Mni Wiconi Water Project

The Mni Wiconi water project is a regional water distribution system being built to transport potable water from the Missouri River to the Pine Ridge Indian Reservation. The pipeline is being built along BIA 41, along the western edge of the park. The construction is primarily within the road prism of existing roads, thus reducing the adverse impacts of the project. The project, which has a statutory completion date of 2013, is expected to be approximately 88 percent complete by the end of fiscal year (FY) 2010. When complete, it will distribute water across 12,500 square miles and will provide a clean, safe, adequate supply of drinking water from the Missouri River to more than 52,000 beneficiaries on three American Indian reservations and within a large non-reservation rural water system embracing nine counties. Project sponsors are the OST, the Rosebud Sioux Tribe, the Lower Brule Sioux Tribe and West River/Lyman-Jones. The clean water supply will help prevent the many water-related health problems the beneficiaries currently

suffer and will spur economic development in the region (U.S. House of Representatives FY 2011 Energy and Water funding).

Dakota, Minnesota, and Eastern Railroad Line

For 15 years Dakota, Minnesota, and Eastern (DM&E) Railroad Line has pushed a proposal to extend its railroad 278 miles to access surface coal mines in Wyoming's Powder River Basin. The line would be near the South Unit, near Red Shirt Table, and about 6 miles from the wilderness boundary in the North Unit. DM&E received regulatory approval from the U.S. Surface Transportation Board on January 30, 2002, to proceed with the \$1.5 billion project. Although the route has been approved, construction has been delayed by court challenges. If the rail line is built, emissions of soot from the diesel locomotives might cause perceptible deterioration of visibility in the park. Currently, the project is on hold. DM&E spokesman, Mike Lovecchio stated that the decision to proceed with expansion will be contingent upon several conditions such as access to a right of way land corridor, mine and utility contract and economic and regulatory environment (<http://journalstar.com>, August 27, 2009 article).

Solid Waste Management Facility

The OST operates a solid waste management facility at Red Shirt, near the south boundary of the South Unit, near BIA 41 and BIA Route 2. The 50-acre landfill facility accepts baled solid waste from the baler at Pine Ridge and from transfer stations located at various communities on the reservation. The landfill, which is lined in accordance with U.S. Environmental Protection Agency (EPA) regulations, uses a leachate collection system. Water quality is monitored through a series of monitoring wells.

Commercial Wind Power Development

On May 27, 2010, the OST Council voted to accept the charter of the OST Renewable Energy Development Authority. This new Authority oversees community and commercial scale renewable energy development on the Pine

Ridge Indian Reservation. The Authority's initial focus is the development of commercial scale wind power, and it has already identified a number of large sites with outstanding Class 5 winds, including sites adjacent to the South Unit.

Paving BIA Route 2 South of South Unit

The OST, through direct funding from the Federal Lands Highway Program, Federal Highway Administration, has proposed to pave 18.5 miles of BIA Route 2 from the junction with BIA Route 27 at the White River Visitor Center west to a point along BIA Route 2. Because of direct funding to the OST, the BIA has no involvement in the project. The OST Transportation Department has indicated the project is in the planning phase and public scoping began in June 2010.

IMPAIRMENT OF PARK RESOURCES OR VALUES

In addition to determining the environmental consequences of implementing the preferred alternative, NPS *Management Policies 2006* (section 1.4) requires analysis of potential effects to determine whether or not proposed actions would *impair* South Unit resources and values.

The fundamental purpose of the national park system, established by the *Organic Act* and reaffirmed by the *General Authorities Act*, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid or minimize to the greatest degree practicable, adverse effects on park resources and values. However, the laws do give the NPS the management discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of a park. That discretion is limited by the statutory requirement that the NPS must leave park resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that would, in the professional judgment of the responsible NPS manager, harm the integrity of

park resources and or values and violate the 1916 NPS *Organic Act* mandate (NPS *Management Policies 2006* 1.4.5). An impact on a park resource or value may, but does not necessarily, constitute an impairment. An impact is more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is

- Necessary to fulfill specific purposes identified in the park’s establishing legislation or proclamation, or
- Key to the natural or cultural integrity of the park or opportunities to enjoy it, or
- Identified as a goal in the park’s general management plan or other relevant NPS planning documents.

Impairment may result from NPS administrative activities; visitor activities; or activities undertaken by concessioners, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park. A determination on impairment is made in the conclusion section for each impact topic related to the park’s cultural and natural resources. A determination of impairment is not required for impact topics such as visitor experience, socioeconomics, and NPS operations.

IMPACTS TO CULTURAL RESOURCES AND SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

In the South Unit GMP/EIS, impacts on cultural resources are described according to the Advisory Council on Historic Preservation –Regulations for the Protection of Historic and Cultural Properties” (36 CFR 800) implementing Section 106 of the *National Historic Preservation Act* of 1966, as amended (16 USC 470(f)). This may include an overall general adherence to NPS policies, regulations, guidelines, and laws; and Tribal law, policies and resolutions that could potentially alter the management actions and practices of the South Unit.

Section 106 requires federal agency officials to take into account the effects of their undertakings on historic properties and to afford the Advisory Council on Historic Preservation an opportunity to comment.

Unlike analyses under NEPA, under the Section 106 process, an “effect” is defined as —an alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register” (36 CFR 800.16i). According to the criteria of —adverse effect” in the regulations (36 CFR 800.5(a)(1)),

an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association.

The regulations further specify,

consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property’s eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

The federal agency official consults with the Tribal Historic Preservation Officer and other consulting parties (possibly including the Advisory Council on Historic Preservation) regarding measures to avoid, minimize, or mitigate adverse effects on a historic property. These agreed-upon measures are memorialized in a memorandum of agreement that is signed by the agency, the Tribal Historic Preservation Officer, and other consulting parties.

Advisory Council on Historic Preservation regulations do not specify thresholds for effects and do not recognize adverse versus beneficial effects. Effects are determined relative to the integrity of the National Register of Historic

Places listed or eligible property's location, design, setting, materials, workmanship, feeling, or association. Title 36 of the Code of Federal Regulations, section 800, does not define what constitutes mitigation, but it provides a process for determining appropriate mitigation in consultation with the Tribal Historic Preservation Officer and other parties. Cultural resources, including historic properties, are nonrenewable. Adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss of integrity of the property that can never be recovered. Therefore, although actions to mitigate the adverse effect may be carried out in compliance with Section 106, the effect on a historic property remains adverse.

A determination of no adverse effect means there is an effect, but the effect would not meet the criteria of adverse effect (36 CFR 800.5(b)).

Finally, a determination of no historic properties affected would be appropriate if no properties eligible for the National Register of Historic Places were to be affected by the action.

The analyses of impacts through the use of impact thresholds in the South Unit GMP/EIS are primarily for the purposes of NEPA. They are intended to assist the NPS with coordinating

its NEPA compliance with Section 106 of the *National Historic Preservation Act*, as amended. The NPS will use the document to consult with the Oglala Tribal Historic Preservation Officer on the actions within the scope of this GMP/EIS. A Section 106 summary is included for each of the cultural resource topics discussed.

However, it must be emphasized that the NPS does not intend to use the South Unit GMP/EIS to meet Section 106 compliance requirements for any individual actions mentioned as part of the alternatives. For all actions to take place following the completion of the GMP/EIS process, the NPS will comply with Section 106 in accordance with 36 CFR 800 as it continues land and resource planning with alternatives analyses and specific proposals for individual properties. As is required under 36 CFR 800, the NPS will consult with the Oglala Tribal Historic Preservation Officer and other consulting parties to determine areas of potential effects; identify cultural resources and evaluate their National Register of Historic Places eligibility; determine effects on historic properties; and develop measures to avoid, minimize, or mitigate adverse effects on historic properties. Measures to avoid, minimize, or mitigate adverse effects would be outlined in a memorandum of agreement (or programmatic agreement).

METHODOLOGIES FOR ANALYZING EFFECTS

The analysis of effects and the conclusions in this chapter are based largely on information from NPS experts, park staff, and professional judgment, as well as on the review of existing literature and studies. The planning team's method of analyzing effects is further explained below. It is important to remember that it is assumed in the analyses that the mitigation measures described in "Chapter 3: Alternatives, Including the Preferred Alternative" would be applied to minimize or avoid impacts. If these measures were not applied, the potential for resource impacts and the magnitude of those impacts would increase.

BASIS FOR DEFINING ENVIRONMENTAL CONSEQUENCES

Terms and Assumptions

Each impact topic includes a discussion of impacts, including the type, intensity, context, and duration, of impact. The environmental consequences of each impact topic were defined on the basis of *type* of effect, *intensity*, *context*, and *duration*. Potential cumulative actions were provided previously in this chapter.

Type refers to an effect being either *adverse* or *beneficial* for the topic being analyzed.

Intensity describes the degree, level, or strength of an impact as negligible, minor, moderate, or major. Because definitions of intensity vary by resource topic, separate intensity definitions are provided for each impact topic.

Context refers to the setting within which an effect is analyzed, such as the affected region or locality. In this document, most effects would be either localized (site-specific) or parkwide. Cumulative effects are either parkwide or regional.

Duration considers whether the impact would occur over the short term or long term. The planning horizon for this plan is approximately 20 years. Unless otherwise

specified, the following terms are used to describe the duration of the impacts:

Short term: The effect would be temporary, lasting a year or less, such as effects associated with construction.

Long term: The effect would last more than one year and could be permanent; for example, the loss of soil due to the construction of a new facility.

The impact analyses for the action alternatives (alternatives B, C, and D) describe the difference between implementing the No-Action Alternative and implementing the action alternative. In other words, to understand the consequences of any action alternative, the reader must also consider what would happen if no action were taken. For all but the No-Action Alternative, all impact analysis assumes that the management of the South Unit will return to the OST. For the No-Action Alternative, this analysis assumes continuation of the current management direction — that is, the NPS continues to manage the South Unit.

Because of the general nature of the alternatives, the potential consequences of the alternatives are analyzed in similarly general terms using qualitative analyses. For many actions discussed in this document, subsequent environmental documents would be required; such documents would be completed following the development of detailed alternatives before the action would be implemented.

INTENSITY DEFINITIONS BY TOPIC

Natural Resources

The natural resource impact topics analyzed in this document are soundscapes, vegetation, and wildlife. Information about known resources was compiled and compared with the locations of proposed developments and other actions. The impact analysis was based on the knowledge and best professional judgment of planners, biologists, and paleontologists, data from park records, and studies of similar actions and effects, when applicable. The planning team

qualitatively evaluated the intensities of effects on all the natural resource impact topics.

The intensity of effects on **vegetation** and **wildlife** was rated as follows:

Negligible: The action might result in a change in vegetation or wildlife, but the change would not be measurable or would be at the lowest level of detection.

Minor: The action might result in a detectable change, but the change would be slight and have a local effect on a population. This could include changes in the abundance or distribution of individuals in a local area, but not changes that would affect the viability of local populations. Changes to local ecological processes would be minimal.

Moderate: The action would result in a clearly detectable change in a population and could have an appreciable effect. This could include changes in the abundance or distribution of local populations, but not changes that would affect the viability of regional populations. Changes to local ecological processes would be of limited extent.

Major: The action would be severely adverse or exceptionally beneficial to a population. The effects would be substantial and highly noticeable, and they could result in widespread change and be permanent. This could include changes in the abundance or distribution of a local or regional population to the extent that the population would not be likely to recover (adverse) or would return to a sustainable level (beneficial). Significant ecological processes would be altered, and “landscape-level” (regional) changes would be expected.

Paleontological Resources

The intensity of effects on **paleontological resources** was rated as follows:

Negligible: The activity would take place in an area devoid of fossil resources and the

chances of disturbing fossils would be extremely unlikely.

Minor: A few fossils might be lost through illegal collecting, or there would be a low probability of effects from a ground-disturbing activity because (a) the activity would be in a geologic layer not known to contain extensive fossils, and the volume of bedrock disturbance would be low or (b) the activity would be in a fossil-rich geologic layer, but the volume of bedrock disturbed would be nearly indiscernible. Monitoring would be likely to detect fossils and the loss of fossils and/or associated contextual information would be minimal.

Moderate: A number of fossils might be lost through illegal collecting, or there would be a moderate probability of effects from a ground-disturbing activity because (a) the activity would be in a geologic layer not known to contain extensive fossils, but the volume of bedrock disturbance would be large or (b) the activity would be in a fossil rich area, and the area of bedrock disturbance would be small. Most fossils uncovered probably would be found by monitoring, but some fossils and/or associated contextual information could be lost.

Major: Many fossils could be lost through illegal collecting, or there would be a high probability of effects from a ground-disturbing activity because the activity would be in a geologic layer of high fossil richness, and the volume of bedrock disturbance would be large. Even with monitoring, many fossils and/or associated contextual information probably would likely be lost.

Soundscapes

The intensity of effects on **soundscapes** was rated as follows:

Negligible: The natural sound environment might be affected, but the effects would be at or below the level of detection, or changes would be so slight they would not be of any measurable or perceptible

consequence to wildlife or the visitor experience.

Minor: There would be a detectable change in the natural sound environment, but the effects would be small, local, and of little consequence to wildlife or the visitor experience.

Moderate: A change in the natural sound environment would be readily detectable, affecting the behavior of wildlife or visitors in a large area.

Major: A severely adverse or exceptionally beneficial change in the natural sound environment would be obvious and would affect the health of wildlife or visitors or cause a substantial, highly noticeable change in the behavior of wildlife or visitors in a local or regional area.

Cultural Resources

Archeological Resources

The intensity of effects on *archeological resources* was rated as follows:

Negligible: Impact is at the lowest levels of detection – barely measurable with no perceptible consequences, either adverse or beneficial. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Minor: Disturbance of a site(s) results in little, if any, loss of significance or integrity and the National Register eligibility of the site(s) is unaffected. For Section 106 purposes, the determination of effect would be *no adverse effect*.

Moderate: Disturbance of a site(s) results in a change in the site's significance and integrity but may not directly affect the site's eligibility for the National Register. A memorandum of agreement is executed between NPS and the Tribal Historic Preservation Officer and, if necessary, the Advisory Council, in accordance with 36 CFR 800.6(b). For Section 106 purposes, the determination of effect would be *adverse effect*.

Major: Disturbance of a site(s) results in a change in the site's significance and integrity, and directly affects the site's National Register eligibility, such that the site and its context may be lost. For Section 106 purposes, the determination would be *adverse effect*. A memorandum of agreement is executed between NPS and Tribal Historic Preservation Officer and, if necessary, the Advisory Council in accordance with 36 CFR 800.6(b).

Museum Collections

Museum collections (prehistoric and historic objects, artifacts, archival documents, manuscripts, and natural history specimens such as fossils) may be threatened by fire, theft, vandalism, natural disasters, and careless acts. The preservation of museum collections is an ongoing process of preventive conservation, supplemented by conservation treatment when necessary. The primary goal is preservation of artifacts and natural history specimens in as stable condition as possible to prevent damage and minimize deterioration. For purposes of analyzing potential impacts, the thresholds of change for the intensity of an impact to museum collections used in the South Unit GMP/EIS are defined as follows:

Negligible: There would be no loss or deterioration of museum specimens or the loss or deterioration would be at the lowest level of detection: barely measurable, with no perceptible consequences, either adverse or beneficial. The use of the collections for research and public education would not change appreciably.

Minor: There would be an effect to the integrity of few items in the museum collection but the effect would not degrade the usefulness of the collection for future research and interpretation. The use of the collections for research and public education would change but in a very small way, which would be noticeable to researchers and the public.

Moderate: The actions would affect the integrity of many items in the museum collection and may diminish the usefulness of the

collection for future research and interpretation, but the effect would not be permanent and the overall condition of the collection would be preserved. The use of the collections for research and public education would change appreciably, and researchers and the public would be immediately aware of the changes.

Major: The actions would affect the integrity of most items in the museum collection and destroy the usefulness of the collection for future research and interpretation; the effects would be permanent and could result in a permanent loss. The use of the collections for research and public education would change.

Ethnographic Resources

The NPS defines *ethnographic resources* as any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it. The decision to call resources ethnographic depends on whether associated peoples perceive them as traditionally meaningful to their identity as a group and the survival of their lifeways. A traditional cultural property is an ethnographic resource eligible to be listed in the National Register because of its association with the cultural practices or beliefs of a living community that are rooted in that community's history, and are important in maintaining the continuing cultural identity of the community (National Register Bulletin 38, *Guidelines for Evaluating and Documenting Traditional Cultural Properties*).

For ethnographic resources, certain important questions about human culture and history can be answered only by gathering information about the cultural material of cultural resources. Ethnographic resources have the potential to address questions about contemporary peoples or groups and their identity and heritage. The ethnographic link is vested in specific places of traditional use with cultural meaning. Ethnographic resources can be eligible for inclusion in the National Register if they meet its criteria for traditional cultural properties. To

those for whom the resources hold cultural meaning, effects on ethnographic resources range from barely perceptible, slight but noticeable, apparent, and strikingly obvious. Those effects correlate respectively with the terms negligible, minor, moderate, and major.

The intensity of effects on *ethnographic resources* was rated as follows:

Negligible: The effects would be barely perceptible, and the action would not alter resource conditions such as traditional access or site preservation or the relationship between the resource and the affiliated group's body of beliefs and practices; there would be no change to a group's body of beliefs and practices.

For Section 106 purposes, the determination of effect on traditional cultural practices would be *no adverse effect*.

Minor: The effects would be slight but noticeable; the action would not appreciably alter resource conditions such as traditional access or site preservation or the relationship between the resource and the affiliated group's body of beliefs and practices.

For Section 106 purposes, the determination of effect on traditional cultural practices would be *no adverse effect*.

Moderate: Effects would be apparent, and the action would alter resource conditions such as traditional access, site preservation, or the relationship between the resource and the affiliated group's beliefs and practices, but the group's beliefs and/or practices would survive. For Section 106 purposes, the determination of effect on traditional cultural practices would be *adverse effect*.

Major: The action would alter resource conditions such as traditional access, site preservation, or the relationship between the resource and the affiliated group's beliefs and practices to the extent that the survival of a group's beliefs and/or practices would be jeopardized. For Section

106 purposes, the determination of effect on traditional cultural practices would be *adverse effect*.

Scenic Resources

Information on scenic resources was compiled from other planning documents, research reports, and consultation with park resource specialist. Impacts were evaluated by comparing projected changes resulting from alternatives to existing conditions or the No-Action Alternative, as appropriate. These evaluations were based on consideration of the parks resources and values, information about what typically contributes or detracts from scenic and visual quality in and around the park and based on professional judgment.

The intensity of effects on *scenic resources* was rated as follows:

Negligible: Impact is at the lowest levels of detection, barely measurable with no perceptible consequences to the visual resources.

Minor: Neither adverse nor beneficial impact(s) would alter a character defining pattern(s) or feature(s) of the visual resources because of scale and size of changes, or by placement of new features in less critical viewsheds. Most park visitors and staff would be unaware of any changes to the visual resources.

Moderate: Adverse impact(s) would alter a character defining pattern(s) or feature(s) of the visual resources but not affect the integrity of the scenic values by providing simple mitigation measures such as vegetative screening, or by placement of features in locations where they would be less noticeable (e.g., adjacent to other similar features or adjacent to larger features on the landscape where mass and scale can be diminished).

Major: Adverse impact(s) would alter a character defining pattern(s) or feature(s) of the visual resource, diminishing the integrity of the visual resource by adding features of uncommon size or scale or by

removing important characteristics of the visual scene.

Visitor Experience

Three factors determine the effects of actions on the visitor experience: access, availability of information, and the range and enjoyment of visitor activity. Changes in available parking spaces, the availability of trailheads, and closure or opening of roads might affect *access* to the primary activity areas of the park. The *availability of information*, orientation, and interpretation can affect visitors' enjoyment of the park, as can the *range of visitor activity*.

The following definitions describe the *types* of effects on the visitor experience:

Visitor Access — beneficial indicates there would be an increase in accessibility to a specific area or a reduction in congestion; **adverse** indicates that the accessibility to a specific area would be reduced or congestion increased.

Availability of Information — beneficial indicates an improvement in opportunities for visitors to obtain information, orientation, and interpretation; **adverse** indicates a reduction in opportunities for visitors to obtain information, orientation, and interpretation.

Range of Visitor Activity — beneficial indicates more opportunities for recreational activities like those mentioned above; **adverse** indicates a reduction in such opportunities.

The intensity of effects on the *visitor experience* was rated as follows:

Negligible: The effect would not be detectable by visitors or would be barely perceptible to most visitors; therefore, it would have no discernible effect.

Minor: The action might result in a slightly detectable effect that would result in little detraction or improvement in the quality of the visitor experience. There would not be an overall effect on the visitor experience.

Moderate: There would be a change in the experiences of a large number of visitors, resulting in a noticeable decrease or improvement in the quality of the experience. A decrease in quality would be indicated by a change in the frustration level or in the inconvenience for a period of time.

Major: A substantial improvement or a severe drop in the quality of many peoples' experience would result from an action such as the addition or elimination of a recreation opportunity or a permanent change in access to a popular area that would be clearly detectable. A substantial, highly noticeable influence could have an appreciable effect on the visitor experience by permanently altering access to and the availability of various aspects of the visitor experience.

Socioeconomics

The South Unit is located within the regional social and economic environment of Jackson, Pennington, and Shannon counties. Effects on the social and economic condition within these counties due to the action alternatives are of concern to the NPS, park managers, local communities and individuals, local governments, and the public.

The South Unit is located entirely within Shannon County. However, Badlands National Park (North and South Units) are one of the many visitor attractions in southwestern South Dakota. It follows that developments proposed by the action alternatives could have a direct effect on some parts of the social and economic environment of the region. Planning team members applied logic, experience, professional expertise, and professional judgment to analyze the impacts of each alternative on the social and economic setting.

Socioeconomic data, expected future visitor use, and future developments in the park all were considered in identifying and discussing the potential effects. A simplistic analysis of the direct effects of each alternative was completed. The identification of these impacts is sufficient for the comparison of alternatives for decision-

making purposes. For the most part, impacts from the action alternatives would be linked to the three-county regional area.

In the socioeconomic analysis, the duration of effects is as follows: short-term effects would last less than three years; long-term effects would last more than three years (and could be considered a permanent change in conditions).

Intensity thresholds were developed to assess the magnitude of socioeconomic impacts resulting from the alternatives under consideration. In the development of these thresholds, it was assumed that beneficial impacts are those that many individuals or groups would accept or recognize as improving economic conditions, either in general or for a specific group of people, businesses, organizations, or institutions. Examples of beneficial effects include lower unemployment, higher personal income, increases in economic diversity and sustainability. Adverse impacts are those that most individuals or groups would generally recognize as diminishing economic welfare, either in general or for a specific group of people, businesses, organizations, or institutions. Examples of adverse effects include fewer job opportunities and increases in cost of living without matching increases in higher income.

The intensity of effects on the **regional and local economy** was rated as follows:

Negligible: Very few individuals, businesses, or government entities are impacted. Impacts are nonexistent, barely detectable, or detectable only through indirect means and with no discernable impact on regional economic conditions.

Minor: A few individuals, businesses, or government entities are impacted. Impacts are small but detectable, limited to a small geographic area, comparable in scale to typical year-to-year or seasonal variations, and not expected to substantively alter economic conditions over the long term.

Moderate: Many individuals, businesses, or government entities are impacted. Impacts are readily apparent and detectable across a wider geographic area and may have a

noticeable effect on economic conditions over the long term.

Major: A large number of individuals, businesses, or government entities are impacted. Impacts are readily detectable and observed, extend across much of the study area, and have a substantial influence on economic conditions over the long term.

Park Operations

Various aspects of park operations, including current staffing levels, funding, levels, partnerships, volunteers, and trends were reviewed. The actions in the alternatives were then analyzed for the impact that they would have upon operations and the availability to manage the park and meet its mission. The area of consideration for determining cumulative impacts encompasses trends throughout the entire National Park System. The intensity of impacts is defined as follows:

Negligible: Park operations would not be affected, or the effects would be at low

levels of detection and would not have an appreciable effect on park operations.

Minor: The effect would be detectable, but would be of a magnitude that it would not have an appreciable effect on park operations. The public would not notice a change. If mitigation were needed to offset the adverse effect, it would likely be successful.

Moderate: The effects would be readily apparent and would result in a substantial change in park operations in a manner noticeable to staff and the public. Mitigation measures would be necessary to offset adverse effects and would likely be successful.

Major: The effects would be readily apparent and would result in a substantial change in park operations in a manner markedly different to staff and the public. The public would likely complain. Mitigation measures to offset adverse effects would be needed, would be extensive, and their success could not be guaranteed.

IMPACTS OF ALTERNATIVE A: THE NO-ACTION ALTERNATIVE

NATURAL RESOURCES

Vegetation

Analysis. Under the No-Action Alternative, resource management within the South Unit would continue as needed. Vegetation surveys would be conducted as warranted and exotic species would be managed and/or native plant populations reintroduced as needed. Grazing leases would remain intact.

The park supports several rare plant species. However, these species occur in sparsely vegetated badlands that are not commonly visited. No impacts are known to be occurring to these populations from visitors at present, and no changes would be expected to occur to the populations under alternative A. The unintentional transport of exotic plants into and around the park by visitors and/or livestock would continue, although the magnitude of this is unknown.

Grazing in the South Unit would continue, altering the types and distribution of vegetation and slowing the restoration of the natural grassland ecosystem. Moderate grazing reduces mean annual aboveground production of mixed grass prairie only a little but can result in a shift in the relative composition of cool and warm season grasses (Plumb and Dodd 1993). Livestock grazing in the South Unit influence not only the grassland composition but also exotic species distribution. Whereas some nonnative species may actually increase under grazing pressure (e.g., Canada thistle), yellow sweetclover appears to be controlled by grazing. For example, yellow sweetclover occurs in greater abundance on ungrazed lands of the North Unit versus similar grazed lands in the South Unit. Conversely, blue grama/buffalo grass grasslands tend to be absent within the lightly grazed or ungrazed lands of the North Unit (Bureau of Reclamation 1999). The continuation of livestock grazing would potentially reduce the mean annual aboveground

production of mixed grass prairie, potentially resulting in a shift in the relative composition of the grasses.

Adverse effects on vegetation from visitors would continue under this alternative. Trampling would affect vegetation at the White River Visitor Center, with the effects ranging from complete absence of vegetation to slight alterations in species composition. Similar effects would be evident along road shoulders, where cars crush vegetation and compact soil, in areas where vehicles are driven off road in the South Unit (such as on Sheep Mountain Table), and in areas where “social” trails are formed. The long-term adverse effects of vegetation loss in local areas would be minor.

Most of the natural vegetation in Badlands National Park would not be affected under alternative A. However, minor long-term adverse effects on vegetation in local areas would continue to be caused by visitor activities and moderate long-term adverse effects could occur as a result of continued grazing.

Cumulative Effects. Other past, present, and anticipated future projects that would contribute both adverse and beneficial impacts on vegetation include (1) the cleanup of the former Bombing Range; (2) resource management actions under the North Unit GMP/EIS; (3) management of motorized vehicle use under the Nebraska National Forest Travel Management Plan; (4) the Mni Wiconi water project; (5) the proposed DM&E rail line; (6) the proposed Crazy Horse Scenic Byway; and (7) potential wind power development projects.

Short-term to long-term minor adverse impacts to vegetation would result from the loss or alteration of vegetation during construction activities in the South Unit, such as the Mni Wiconi water project, the proposed DM&E rail line, and the proposed Crazy Horse Scenic Byway. Work at the White River Visitor Center and cleanup efforts at the Bombing Range may cause the loss of natural vegetation and have the potential to contribute to cumulative adverse

impacts. Actions outside of the park, including the construction and operation of the DM&E rail line and the designation of the proposed Crazy Horse Scenic Byway, which could increase visitation to the park, and the construction of primitive campgrounds and trails in the national grassland adjacent to the park could alter or cause the loss of native plants. These other actions, and a likely increase in visitation, would result in a long-term minor adverse cumulative effect on the region's native vegetation. Some vegetation would be cut and removed during construction and operation of the roadway and rail line, potentially increasing invasive plant species until mitigation measures are employed. This would result in short-term negligible adverse impacts to vegetation. In addition, park maintenance operations along existing roads would continue to affect plants growing on road shoulders. The construction of the Mni Wiconi water pipeline probably would cause negligible effects on vegetation because it would be built along roads where native vegetation has been altered. The development of wind power projects outside of the park could result in localized long-term minor adverse impacts with the removal of vegetation.

In addition to cumulative actions that have negative effects on vegetation, there are also some actions that have beneficial effects. Long-term beneficial effects on the park's vegetation would result from the reintroduction of native vegetation and weed management efforts. A beneficial long-term effect on range condition would result from increases in prescribed burning in the adjacent Buffalo Gap National Grassland by reducing fire hazard fuel accumulations and aiding in fire suppression activities by reducing fire intensity and severity protecting existing native vegetation, as is delineated in the Land and Resource Management Plan for the Nebraska National Forest and Associated Units (USFS 2001). The resource management actions under the North Unit GMP/EIS identifies desired conditions including specific vegetation conditions for management areas, to help restore native plant communities. Additionally, the management of motorized vehicle use under the Nebraska National Forest Travel Management Plan could

have long-term beneficial impacts to vegetation by improving resource protection practices.

Overall, there would be long-term negligible to minor adverse cumulative effects impacts on vegetation. However, the actions of alternative A would add a minimal increment to the cumulative impact of this alternative.

Conclusion. Alternative A would have minor to moderate long-term adverse effects on vegetation due to grazing and visitor activities. The impacts of other past, present, and anticipated projects combined with alternative A would likely result in long-term negligible to moderate adverse impacts to vegetation. There would be no impairment of vegetation from implementation of the No-Action Alternative.

Wildlife

Analysis. Wildlife is affected by the activities of visitors and park staff. The extent of the effect depends on many factors, including the type, predictability, frequency, and timing of the recreational activity (Knight and Cole 1995). Human actions also can result in the loss of wildlife habitat. For example, trampling or removing vegetation can reduce or eliminate cover for wildlife. The use of the park by visitors is concentrated mostly in the developed area at the White River Visitor Center. Animals sensitive to human activities would continue to avoid this area.

The effects of visitors on wildlife in the South Unit have not been documented. However, in trying to see wildlife better, hikers have been observed disturbing bighorn sheep and bison. It is possible that visitors might adversely affect sheep lambing in places. Aircraft overflights also might disturb bighorns and other wildlife in the park.

The South Unit is open to big game hunting by members of the OST with a valid Tribal hunting license with restrictions as agreed upon by both OSPRA and Badlands National Park (NPS 2009a). Big game includes mule deer, white-tail deer, and pronghorn antelope. These hunts, which are regulated by the OST and the NPS, are believed to have not adversely affected the populations of these animals. Hunting in the

South Unit by Tribal members would continue. Although the harvest of deer, pronghorn antelope, and small mammals might result in a temporary negligible to minor adverse effects on the wildlife populations at the South Unit, there would be a beneficial long-term effect on some species from keeping those numbers in check.

The occasional injury or death of wildlife from motor vehicles on roads would continue. However, the adverse effects on wildlife from these activities would be local and negligible to minor.

Maintenance activities in the park would continue to disturb some animals temporarily.

Cumulative Effects. Past, present, and anticipated projects that would contribute to impacts on wildlife include (1) resource management actions under the North Unit GMP/EIS; (2) resource management actions under the Buffalo Gap National Grassland Land and Resource Management Plan; (3) modifications to motorized travel under the Nebraska National Forest Travel Management Plan FEIS; (4) wilderness designation under the proposed *Tony Dean Cheyenne River Valley Conservation Act* of 2010; (5) Prairie Dog Management Plan activities and plague efforts; (6) training activities of the South Dakota National Guard; (7) construction activities associated with the Mni Wiconi water project; (8) the proposed DM&E rail line; (9) the proposed Crazy Horse Scenic Byway; (10) potential wind power development projects; and (11) paving of BIA Route 2. These actions would likely have short- and long-term minor adverse impacts on wildlife due to land disturbance activities from construction and other human uses, resulting in some mortality to wildlife, increased fragmentation of wildlife habitats, increased potential for wildlife to be displaced and reduced number of areas where wildlife could exist without people or facilities. These actions would also have long-term beneficial impacts on wildlife from improved resource management, additional protections from designation of wilderness area, and decreased impacts from motorized vehicles. Management efforts to expand prairie dogs at Buffalo Gap National Grassland and plague

dusting efforts in the North Unit would have beneficial effects on the species. When the beneficial and adverse impacts of other past, present, and anticipated projects are considered with the impacts of alternative A, there would be long-term minor adverse impacts on wildlife.

Conclusion. Negligible to minor short-term adverse effects on wildlife populations would continue under alternative A in local areas from the presence of visitors and staff. Minor long-term adverse cumulative effects would be expected on wildlife populations at the South Unit. There would be no impairment of wildlife from implementation of alternative A.

PALEONTOLOGICAL RESOURCES

Analysis. Because of the Oglala Sioux Tribal moratorium on fossil collecting, no paleontological inventories, excavation, or legal collecting have occurred within the South Unit since 2002. If the current situation continued, little to no fossil resource discovery would occur in the future. The NPS has data indicating fossils are currently being affected by intensive illegal collecting, foot traffic, and vehicle traffic (NPS 1999). Livestock trampling, natural weathering, and mass wasting (landslides) also degrades and destroys exposed fossils in the White River Group very quickly (Rom and Potapova 2009).

Illegal fossil collecting occurs throughout the infrequently patrolled South Unit. Amateur and commercial collectors also take fossils from the South Unit.

The extent of all of the above impacts would likely have a long-term moderate adverse impact on the park's resources. Under this alternative no change in current management would occur. Therefore, these long-term moderate adverse impacts would continue unchecked into the foreseeable future under alternative A.

Cumulative Effects. The primary projects and actions that could contribute to cumulative effects include (1) the cleanup of the former Bombing Range; (2) resource management actions under the North Unit GMP/EIS; (3) actions on the Buffalo Gap National Grassland; (4) the Mni Wiconi water project; (5) the proposed DM&E rail line; (6) the

proposed Crazy Horse Scenic Byway; (7) a fossil resources protection ordinance planned by the OST. The impacts of other past, present, and anticipated projects on paleontological resources, when considered with the impacts of alternative A, would be short- and long-term moderate adverse.

The *2006 North Unit General Management Plan* provides for paleontological inventories, collection and excavation to protect fossil resources. It also provides for a strong law enforcement presence to minimize illegal collection activities.

The *Nebraska National Forest Land and Resource Management Plan* would not affect the paleontological resources at the South Unit. Other actions that may be taken in the grassland in the future that could affect the South Unit are changes in public access (such as limiting or closing public access in areas adjacent to the park) and changing livestock stocking rates. These actions would likely reduce damage or destruction to fossils through reduced opportunities for illegal collection, reduced livestock trampling, and reduced vehicle damage. These should result in a minor beneficial impact for paleontological resources.

The Mni Wiconi water project carried out paleontological resources inventories and implemented measures to protect fossils. It should have a minor beneficial impact.

The proposed DM&E rail line, if constructed, may have a minor impact on fossil resources. However, paleontological inventories were carried out and appropriate protection measures are expected to be implemented. In most cases, if important fossil resources are within the DM&E project corridor they will need to be collected and preserved to protect them.

The OSPRA is pursuing Federal Highway Administration approval for the proposed 215-mile Crazy Horse Scenic Byway (Lakota Country Times, October 13, 2009, Article by Tom Katus). The byway is likely to increase visitation within the South Unit, potentially increasing fossil loss through increased theft and pedestrian traffic trampling.

Conclusion. Alternative A would have the potential to result in continued moderate long-term adverse effects on paleontological resources. This would be caused primarily by the continued illegal removal of fossils from the South Unit by visitors and collectors, continued livestock trampling of fossils, and continued weathering and mass wasting (landslides). Added to this, other actions in and outside of the park could result in a long-term cumulative moderate beneficial impact. Most impacts to fossil resources outside of the South Unit are being addressed and mitigated through actions such as law enforcement, inventory of planned projects, and collection for study and preservation.

Long-term moderate adverse effects would be anticipated on paleontological resources under alternative A. Despite the loss of some fossil resources, the NPS would not be prevented from fulfilling the purposes for which Badlands National Park was established. The loss of resources would not destroy the integrity of the park relative to paleontological resources—fossils would continue to be present throughout the park, and the park staff would continue to protect paleontological resources. People still could come to the South Unit and enjoy its values, including its fossils. There would be no impairment of paleontological resources from implementation of alternative A.

SOUNDSCAPES

Analysis. No new actions would be taken under alternative A that would result in changes to noise levels. Possible increases in visitation to the South Unit could result in a slight increase in vehicle traffic and associated noise, causing a long-term negligible adverse effect. Low visitor levels would continue to generate noise, most of which would continue to be confined to developed visitor and administrative areas, including the White River Visitor Center, as well as areas outside the South Unit, such as the adjacent BIA Routes 27 and 2, and BIA 41.

Cumulative Effects. At different times, short-term minor to moderate adverse effects from noise would be caused by park construction machinery within the South Unit, including

construction of the Lakota Heritage and Education Center (LHEC). Cleanup operations of the former Bombing Range would also likely cause short-term minor to moderate adverse effects on soundscapes within the South Unit. Outside the South Unit, the construction of the Mni Wiconi water project, construction and operations of wind power projects, and paving of BIA Route 2 would generate noise that would potentially be audible in places in the South Unit. Traffic along BIA Routes 27 and 2, and BIA 41, as well as traffic leading to the solid waste management facility at Red Shirt would continue to generate noise intrusions in the South Unit, resulting in long-term negligible to minor adverse impacts on soundscapes within the South Unit. The potential extension of the DM&E rail line and the construction of the proposed Crazy Horse Scenic Byway could also have short-term negligible to minor adverse impacts on soundscapes within the South Unit. The development of an air tour management plan would include the development of soundscape goals, objectives, and standards and identifying appropriate measures for mitigating noise impacts. These effects, added to noise caused by visitors and park operations under alternative A, would result in short and long-term minor to moderate cumulative adverse noise effects in local areas. When these noises are combined with the sounds of visitor and administrative use in the South Unit, there could be negligible to minor, long term, adverse cumulative impacts on soundscapes.

Conclusion. Most of the South Unit would continue to be relatively quiet under alternative A. However, there would continue to be long-term negligible to minor adverse effects on the park's soundscape in local areas, largely from visitation and administrative activities under developed areas. Noise from activities in alternative A added to noise from other actions within and outside the South Unit could result in short-and long-term, negligible to minor adverse cumulative effects in local areas. These effects would not be sufficient to constitute an impairment of park resources or values.

CULTURAL RESOURCES

Archeological Sites

Analysis. No cultural resources inventory is currently being conducted to comply with the *National Historic Preservation Act*. There are no ongoing archeological inventories, excavation, or legal collecting within the South Unit because there are currently no planned projects that would necessitate such inventory and other actions other than the LHEC, discussed below. However, recent inventories have occurred to support Bombing Range cleanup activities (Rom 2010). It is likely that archeological sites and artifacts are being adversely affected by activities, such as theft, vehicle use, and livestock trampling, because these impacts have been documented nearby, but the magnitude of these activities and potential effects are not known. Current and future livestock trampling, natural weathering, and mass wasting (landslides) can adversely affect archeological sites very quickly as recent studies for Bombing Range cleanup activities and other observations have shown (Rom 2010).

Most illegal collecting probably occurs relatively close to roads where park visitors likely could take artifacts illegally, either knowingly or unknowingly. Illegal collecting is not well documented, but can be a problem.

The NPS has Section 110 responsibilities under the *National Historic Preservation Act* to inventory all of its lands to identify and protect archeological sites. These inventories are not currently being carried out and they are not planned under the No-Action Alternative.

The extent of all of the above impacts likely would be a short and long-term moderate adverse effect on the park's archeological resources.

Cumulative Effects. Past, present, and anticipated projects that would contribute to impacts on archeological resources include (1) the cleanup of the former Bombing Range; (2) resource management under the North Unit GMP/EIS; (3) actions on the Buffalo Gap National Grassland; (4) potential construction projects, including the Mni Wiconi water

project, the proposed DM&E rail line, the proposed Crazy Horse Scenic Byway, wind power projects, and paving of BIA Route 2. These combined actions would likely have beneficial impacts on archeological resources as long as they provide for appropriate inventory, protection, avoidance, and preservation of cultural resources. The impacts of other past, present, and anticipated projects, when considered with the impacts of alternative A, would result in short- and long-term minor adverse impacts on archeological resources.

The *2006 North Unit General Management Plan* provides for archeological inventories, collection and excavation to protect cultural resources. It also provides for a strong law enforcement presence to minimize illegal collection activities. These should result in a beneficial impact for archeological resources.

A *Nebraska National Forest Land and Resource Management Plan* would not affect the South Unit's archeological resources. Other actions that may be taken in the grassland in the future that could affect the South Unit are changes in public access (such as limiting or closing public access in areas adjacent to the park) and changing livestock stocking rates. These actions would likely reduce damage or destruction to fossils through reduced opportunities for illegal collection, reduced livestock trampling, and reduced vehicle damage. These should result in a beneficial impact for archeological resources.

All proposed construction projects should include archeological resources inventories and implemented measures to protect them. If so, these projects should have a beneficial impact on archeological resources as additional surveying would occur.

The OSPRA is pursuing Federal Highway Administration approval for the proposed 215-mile Crazy Horse Scenic Byway (Lakota Country Times, October 13, 2009 Article by Tom Katus). The byway is likely to increase visitation within the South Unit, potentially increasing cultural resource loss through increased theft and pedestrian traffic trampling.

Conclusion. Alternative A would have the potential to result in continued minor to

moderate short to long-term adverse effects on archeological resources. This would be caused primarily by the continued illegal removal of cultural resources from the South Unit by visitors and collectors, continued livestock trampling, and continued weathering and mass wasting (landslides). These impacts could be mitigated by continuing efforts to educate visitors about archeological sites and efforts to allocate existing law enforcement resources towards fossil protection. Added to this, other actions in and outside of the park could result in a cumulative beneficial impact. Most impacts to cultural resources outside of the South Unit are being addressed and mitigated through actions such as law enforcement, inventory of planned projects, and collection for study and preservation.

The effects on archeological resources under alternative A are anticipated to be moderately adverse; however, this would not constitute an impairment of park resources or values. For Section 106 purposes, the determination would be *adverse effect*.

There would be no impairment of archeological resources from implementation of alternative A.

Museum Collections

Analysis. Under alternative A, collections would remain at the South Dakota Archeological Research Center, South Dakota School of Mines Museum of Geology; the Oglala Sioux Tribal Historic Preservation Office; Badlands National Park Collections Storage Unit in the North Unit; the Midwest Archeological Center in Lincoln, Nebraska; and at other unknown facilities worldwide. Some of those collections are out of direct control of the park, and though it is assumed that those housed in known curatorial facilities are at least minimally meeting museum storage standards, some museum collection curation facilities meet the requirements of 36 CFR 79 (Curation of Federally-Owned and Administered Archeological Collections). Those unknown curatorial facilities likely provide various storage conditions. With the known curatorial facilities, there is some space for collections research. In addition, there are limited museum display conditions for public

education. The LHEC would provide curatorial space to modern standards, but it may or may not be of sufficient size to accommodate all of the collection in known curatorial facilities. There would be a minor impact on the museum collections.

Cumulative Effects. Numerous museums and private parties holding archeological and fossil collections from the badlands of South Dakota exist throughout the world as a result of excavations by government agencies, universities, historical societies, and individuals over the last approximately 150 years. Known collections at the facilities in South Dakota are extensive. The collections within the park make up a small but important portion of the whole collection. The collections would be expanded through donation, testing prior to development, excavations of sites inadvertently identified during construction work, or monitoring resource condition in the field. The collection is not expected to greatly increase through these activities. Other activities identified as occurring within and external to the South Unit are unlikely to add a large amount of museum specimens to the collections. Cumulative impacts are expected to be negligible adverse.

Conclusion. Items in the collections would continue to be stored and maintained, with some facilities meeting NPS museum storage standards. There would be no long-term overall impact on the preservation and usefulness of the collections. Accessibility to the collection by researchers and the public would remain unchanged. Because there would be no major adverse effects on this resource, there would be no impairment or unacceptable impacts.

Ethnographic Resources

Analysis. Ethnographic resources, such as a site, structure, landscape or natural resource feature assigned traditional legendary, subsistence religious or other significance, in addition to traditional cultural properties, exist in the area and are generally acknowledged as part of the historical territory of the Lakota branch of the Sioux. The South Unit contains evidence of continuing Lakota traditional spiritual uses. Current ethnographic information provided by

the OST has indicated that several areas are known to have special spiritual significance for them.

Under the No-Action Alternative, NPS staff would consult with the OST to develop and accomplish programs in a way that respects the beliefs, traditions, and other cultural values of the Tribe that has ancestral ties to South Unit lands. NPS staff would maintain government-to-government relationship with the Tribe to ensure a collaborative working relationship and would consult regularly with them before taking actions that would affect natural and cultural resources that are of interest and concern to them. Access to, and ceremonial use of, American Indian sacred sites by American Indian religious practitioners would continue to be accommodated in a manner that is consistent with applicable law, regulations, executive orders, and policy.

Ethnographic resources, including sacred sites and traditional cultural properties, would not be identified and protected from impacts associated with the implementation of this alternative. Alternative A would not result in any change in access by American Indians or use of ethnographic resources sacred to the tribes. The alternative would not change the agreement that guarantees tribal members unrestricted access in perpetuity and requires their written consent to affect those sites. Under alternative A, no interpretation of cultural or ceremonial sites would occur. Limited interpretation of Oglala Sioux history and culture would continue at the White River Visitor Center. Without interpretation and with limited management of natural resources, specifically as it relates to the protection of culturally significant plants and wildlife, the impact of the No-Action Alternative would be long-term moderate adverse.

Cumulative Effects. Past, present, and anticipated projects that would contribute to impacts on ethnographic resources would be the same as those listed for archeological resources above. The impacts of other past, present, and anticipated projects, when considered with the impacts of alternative A, would result in beneficial impacts to ethnographic resources.

For the cleanup of the Bombing Range, removal of munitions could allow safer Tribal member access to important areas, and provide a beneficial impact. Potential visual impacts of munitions removal is generally short term and limited in scope. However certain removal methods in “high density” debris areas can result in complete removal and replacement of up to several feet of surface and subsurface soils over large areas (70 acres or more) by remote controlled heavy equipment. If such removal is necessary within the viewshed of an ethnographic resource or traditional cultural property moderate adverse visual effects could result. Such cleanup activities could only occur after consultation with an authorization by the OST (Rom 2010).

Construction projects would be expected to conduct ethnographic resource inventories and consultation to provide appropriate identification and protection. Beneficial impacts would be expected in the long term.

The proposed DM&E rail line, if constructed, would likely have a moderate to major adverse impact on ethnographic resources (Grassrope, pers. comm.; Whiting pers. comm.). However, consultation and inventories were carried out and appropriate protection measures are may be implemented when possible. In most cases, if ethnographic resources are within or adjacent the DM&E project corridor the corridor cannot be easily modified to protect them. Therefore, major long term adverse effects are possible.

Conclusion. Alternative A would have the potential to result in long-term moderate adverse impacts on ethnographic resources due to continuing current management and access. Added to this, other actions in and outside of the park could result in a beneficial impact as well as the DM&E project’s potential long-term moderate to major adverse effects. Most impacts to ethnographic resources outside of the South Unit are being addressed and mitigated through actions such as inventory of planned projects, Tribal consultation, documentation and preservation. For Section 106 purposes, the determination would be *adverse effect*.

Because there would be no adverse impacts, the park’s resources and values would not be impaired.

SCENIC RESOURCES

Analysis. Under the No-Action Alternative, there would no new human-made structures or vehicles areas in the park that would affect scenic quality. This alternative would not introduce new sources of outdoor light and therefore, would not affect the ability to view the night sky.

Cumulative Impacts. Normal maintenance of the main park roads, parking areas, and day-to-day park operations would result in a negligible short term localized, adverse impact on scenic resources. Any expanded residential or ranching structures would be visible in the vast open areas of the South Unit in the future. Expanding developments and activities related to ranching could generate more dust. Overall such development and activities would intrude upon the area’s scenery affecting visibility and introducing new light sources into the night sky. Community and commercial scale renewable energy development on the Pine Ridge Indian Reservation could have major adverse impacts on the scenic resources of the South Unit, permanently altering the panoramic vistas with the construction of wind turbines and/or solar panels on sites adjacent to the South Unit.

The No-Action Alternative would contribute long-term, localized, negligible to moderate, adverse impacts to scenery, but would not affect visibility or the night sky. Combined with other past, present, and reasonably foreseeable future impacts, on scenery and visual quality, the No-Action Alternative would have minor to major localized and regional adverse impacts on scenic resources.

Conclusion. The No-Action Alternative would have long-term, localized, minor to major, adverse impacts on scenery, but would not affect visibility or the night sky. There would be no impairment of scenic resources and visual quality from this alternative.

VISITOR EXPERIENCE

Access

Analysis. The overall accessibility of the South Unit to visitors would not change under alternative A; that is, there would be no changes in the operation or location of the entrances, in the major roadways in the park, in the amount of available parking, in visitors' access to existing park facilities, such as the White River Visitor Center, or in access to trailheads. Driving and hiking access still would be limited to two-track primitive roads. The condition of the roads still would limit access primarily to high-clearance vehicles.

The roads to Sheep Mountain and Blindman Tables would remain primitive with relatively unrestricted use, but the road condition still would affect visitors by limiting access to high-clearance vehicles. The Palmer Creek area still would be relatively inaccessible for most visitors because overland travel requires a high-clearance vehicle and local knowledge of the unmarked routes.

Overall, facilities still would be deficient in the South Unit. Because the No-Action Alternative would not involve any changes to existing conditions, the continued lack of access to the South Unit would have long-term minor adverse impacts on visitors.

Cumulative Effects. Traffic projections indicate that a substantial increase in park visitation could result from the completion of the Heartland Expressway and the proposed Crazy Horse Scenic Byway. The increase from these roads originating from the south and west, added to visitation projections, could alter the current visitation patterns to the park. The routes for these two road projects already exist, but typically park visitors do not use them. Visitor access to the South Unit would be improved by the upgrading of the roads and by their being emphasized with designations.

Implementing alternative A would continue to affect visitor access to the park. When combined with the projects listed above, impacts to visitor access would be long-term minor adverse as the beneficial impacts provided by the additional

routes above do not improve access within the South Unit.

Conclusion. Alternative A would result in long-term minor adverse impacts to visitor access.

Availability of Information

Analysis. Under the No-Action Alternative, the White River Visitor Center would continue to be the only source of orientation, interpretation, and education in the South Unit until the LHEC is completed. Visitors to the South Unit still would have to travel long distances without being able to get information about the park and its resources. The White River Visitor Center would be open only during the peak season. The lack of facilities in the South Unit would continue to limit visitors' ability to get information about the park.

Educational opportunities for schools and organized groups would continue to be limited by a lack of adequate facilities, and there still would be no access, facilities, signs, or interpretive waysides along SD 44.

Cumulative Effects. Continuing alternative A would result in minor long-term adverse effects on the visitor experience, because opportunities to obtain information in the South Unit are limited. Visitation to the South Unit would increase if the proposed Crazy Horse Scenic Byway were approved and after the construction of the LHEC is completed. When developed, the LHEC would be an outlet for distributing information to the public, resulting in long-term minor to moderate beneficial effects on the availability of information.

Conclusion. Alternative A, the No-Action Alternative, would result in continued adverse effects on the experience for visitors to the South Unit. The current effects on the visitor experience are minor; however, if changes in visitation patterns continue, the effects could become more severe.

Range and Enjoyment of Visitor Activity

Analysis. The five most popular visitor activities in Badlands National Park are vehicle use, hiking, pack stock use, camping, and

picnicking. Those activities are discussed separately in the Consequences section for each alternative.

Vehicle Use. The existing range of driving opportunities in the park would continue under alternative A. In the South Unit, a sense of exploration in a primitive environment would be available for visitors. The use of high-clearance vehicles would continue on the network of primitive two-track roads; travel in this area would be difficult for visitors in passenger cars because of the primitive rutted dirt roads. Road closures and openings would continue to be weather-dependent, but generally these roads would be closed in winter. Visitation to the South Unit would continue to be limited by distance, lack of information, and inaccessibility to the general public. The popular road onto Sheep Mountain would continue to be open, and the existing two-track roads on the mountain would remain open. Overall, this alternative would result in long-term minor adverse impacts to visitor range and enjoyment of activity.

Hiking and Pack Stock Use. Implementation of alternative A would have long-term negligible adverse impacts on hiking and pack stock use due to the continued lack of designated trails and pack routes, as well as the lack of corrals and loading areas.

Camping. There are no existing NPS-sanctioned camping opportunities in the South Unit. Isolated incidents of backcountry, primitive camping would continue. Long-term negligible adverse effects from lack of camping opportunities would occur under alternative A.

Picnicking. Picnicking would continue to occur at the White River Visitor Center. Long-term negligible impacts would result due to limited picnic areas.

Cumulative Effects. It is projected that various plans for road improvements in the region would increase opportunities for driving and sightseeing. If the proposed Crazy Horse Scenic Byway were designated and marked by signs, it would offer an additional scenic driving opportunity in the region. The management plan for Buffalo Gap National Grassland calls for the development of a primitive campground near the

South Unit, expanding the region's camping opportunities (USFS 2001). These projects would result in long-term benefits for visitors seeking recreational opportunities in the region.

The No-Action Alternative would maintain the status quo, which provides a range of informal, unsanctioned opportunities for South Unit visitors. The long-term benefits of the regional projects, coupled with the negligible adverse effects of implementing alternative A, would result in long-term cumulative beneficial effects on the visitor experience.

Conclusion. Implementing alternative A would result in long-term negligible adverse effects on visitor range and enjoyment of activities.

SOCIOECONOMICS

Analysis. Under the No-Action Alternative, activities associated with the South Unit would continue to generate a small level of economic activity in the study area over the life of the plan. This activity would continue to generate minor beneficial economic impacts. The NPS estimates the operating expenditures including such items as payroll, supplies and travel to operate the South Unit to range between \$160,000 and \$180,000 per year. The operation requires two full-time positions. This infusion of federal agency spending into the economy would likely generate additional economic activity in terms of jobs and income of other businesses and individuals that support operations or park service employees. Additional economic activity occurs when visitors, coming to the South Unit spend money in the local economy during their trip. Current visitation to the South Unit is approximately 9,500 per year, which is a small fraction of the estimated visitation to the North Unit which supports over 800,000 visitors per year. Thus, the economic impact from visitation to the South Unit under the No-Action Alternative would be expected to be negligible adverse. Economic benefits associated with grazing leases that are expected to continue on the South Unit.

Cumulative Impacts. Past, present, and anticipated projects that would contribute to impacts on socioeconomics include (1) the

cleanup of the former Bombing Range; (2) resource management under the North Unit GMP/EIS; (3) approval of the proposed Crazy Horse Scenic Byway. These combined actions would likely have short- and long-term beneficial impacts on socioeconomics due to increased access and exposure to the opportunities at the South Unit. The cumulative effects of all these projects could lead to additional visitation to the South Unit, potentially generating additional economic benefits through increased visitor spending. The impacts of other past, present, and anticipated projects, when considered with the impacts of the No-Action Alternative, would result in beneficial impacts on socioeconomics.

Conclusion. The socioeconomic effect of operations and visitor use at the South Unit under the No-Action Alternative would be long-term, negligible, and adverse.

PARK OPERATIONS

Analysis. Under the No-Action Alternative, it is assumed that staff would continue to focus on the core mission of the park in the same manner and degree as previous years. For FY 2010 the park devoted approximately \$166,000 for the annual operation cost for the South Unit. This amount covered the cost of 2 full-time positions and their overhead for operating the White River Visitor Center. This amount is a portion of the park's 2010 annual operating cost which was \$4.6 million. Modest increases in park operations would be sought to improve interpretation and resource protection. Basic functions such as law enforcement and general maintenance of the park's infrastructure would remain high priorities. Programs that have a long-range benefit of enriching visitors and protecting resources such as education and outreach to schools would continue to be sought, but difficult to expand without an approved plan. Similarly, without an approved plan that identifies management zones it would be increasingly difficult to successfully obtain funding or partnerships for future resource management programs. The effects of the lack of a clear plan and management zones on park

operations would be adverse, moderate, and long term.

Volunteers and the Badlands Historic Association would remain important in the park operations. Programs to involve volunteers in inventory, monitoring, interpretation and outreach, cultural resource restoration, campground hosting, trail patrol, light maintenance, and other aspects of park operations would be continued. However, their effectiveness and ability to grow would be hampered over time by the lack of clear plan. The effects of this alternative on the volunteer program would be adverse, long term, and moderate.

Cumulative Impacts. The park has always promoted volunteers and has had good results in recruiting skilled older people with outside sources of income, who thoroughly enjoy their contribution to the national park system. This is particularly source of labor is important to the South Unit since very little resources have been devoted to this unit. This source of labor would continue to be important to the park and efforts to promote the value of such resources would continue to be a high priority. Without a clear plan to focus these efforts, it would be increasingly difficult to leverage the most out of this opportunity.

Conclusion. Lack of a clear plan and management zones would lessen the effectiveness of existing staff and volunteers over time. This would result in adverse long-term moderate impacts to the operation of the park.

UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts are defined as impacts that cannot be fully mitigated or avoided.

Minor adverse impacts on natural resources would be caused by human use in some areas in the South Unit resulting from ongoing recreational use of land and facilities (e.g., soil compaction, vegetation trampling, wildlife disturbances, and decreased opportunities for solitude). Although these impacts would be

unavoidable, mitigation to reduce them would be carried out where possible.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments of resources are actions that result in loss of resources that cannot be reversed. Irretrievable commitments of resources are actions that result in the loss of resources but only for a limited period of time.

With the exception of consumption of fuels and raw materials for maintenance activities, no actions in this alternative would result in consumptions of nonrenewable natural resources or use of renewable resources that would preclude other uses for a period of time.

RELATIONSHIP OF SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

The South Unit would continue to be administered to protect resources in their natural state and provide for the care, maintenance, and preservation of prehistoric, historic, scientific, and scenic interest; interpret the history of the Sioux Nation and Oglala people; and continue to maintain existing facilities that would provide for public use and enjoyment.

Under alternative A, the South Unit would continue to be managed as it is, and no management zones are prescribed. Under the No-Action Alternative, the park would maintain its long-term productivity and there would be virtually no new development or appreciable loss of long-term ecological productivity.

IMPACTS OF ALTERNATIVE B: EXPAND INTERPRETIVE OPPORTUNITIES

NATURAL RESOURCES

Vegetation

Analysis. Vegetation would be lost or altered in local areas under alternative B, primarily from the development or improvement of facilities and visitor services. Most new developments or improvements would be placed within the existing footprint of disturbed areas in which the vegetation already has been altered within the developed areas of the park; therefore, little additional loss of native vegetation would result from construction or improvement activities related to the White River Visitor Center. Given the previous vegetation disturbance along existing perimeter roadways in most of these areas, and with the use of appropriate mitigation measures to minimize additional impacts (such as ensuring that equipment stays within project area boundaries, revegetating disturbed areas with native vegetation, avoiding known or possible locations for special-status plant species, and taking steps to avoid the spread of exotic species), there would be negligible to minor adverse effects on native vegetation from these actions.

New facilities would be built in previously undisturbed areas. Despite the use of mitigation measures to help reduce the loss of native prairie vegetation, some vegetation would be permanently disturbed or lost in these areas resulting in a long-term minor adverse impact.

The elimination of livestock grazing in Range Unit 505 would have an influence on the distribution of some plant species and plant associations resulting in short- to long-term beneficial and short- to long-term negligible adverse effects on vegetation. Moderate grazing reduces mean annual aboveground production of mixed grass prairie only a little but can result in a shift in the relative composition of cool and warm season grasses (Plumb and Dodd 1993). Livestock grazing in the South Unit of the park influence not only the grassland composition but

also exotic species distribution. Whereas some nonnative species may actually increase under grazing pressure (e.g., Canada thistle), yellow sweetclover appears to be controlled by grazing. For example, yellow sweetclover occurs in greater abundance on ungrazed lands of the North Unit versus similar grazed lands in the South Unit. Conversely, blue grama/buffalo grass grasslands tend to be absent within the lightly grazed or ungrazed lands of the North Unit (Bureau of Reclamation 1999).

Constructing new parking lots and improving the existing road to the quarry west of Sheep Mountain Table would cause both direct and indirect adverse effects on prairie vegetation. Native grassland vegetation would be lost or damaged during siting, construction, improvement, and maintenance of the parking lots and roadway. Some rare plants could be lost, although it might be possible to locate improvements to the road to avoid those plants. Some native plants would be permanently lost because of the parking lot or road footprint. Several indirect impacts also could result from the improvement of the road segment. If erosion along the road increased, more vegetation would be lost. Nonnative plants could be introduced or spread into disturbed areas. If visitors created additional —informal” pull-offs by parking off the side of the road, some roadside plants might be crushed, trampled, or picked. Even with mitigation measures, construction equipment in the project area would result in the damage or loss of other plants resulting in short- to long-term negligible to minor adverse impacts to vegetation.

Vegetation also would be altered or lost through increased visitation under alternative B. As under alternative A, people walking over and trampling plants in and around existing facilities would result in the loss of native vegetation, a long-term minor to moderate adverse effect.

As soils would be affected, building or designating new trails and routes would cause both beneficial and adverse effects for the park’s

vegetation. Hiker and pack stock use would increase on new trails on the perimeter and the interior, resulting in the trampling and loss of vegetation. More erosion in any of these areas would cause the loss of some plants, and the potential for visitors or pack stock to inadvertently carry in and spread exotic species also would increase. Developing a trailhead in the South Unit could encourage more four-wheel-drive use of the unimproved roads in this area, which in turn could increase erosional impacts and native plant loss. If more pack stock used this area, there would be increased potential for the spread of exotic species. Depending on the level of use, time of use, and the vegetation, there could be a minor to moderate long-term adverse impact on vegetation in local areas.

Designating campsites along the primitive roads in the South Unit would increase use in these areas so that some native vegetation probably would be trampled or lost. However, the loss of vegetation from indiscriminate camping and the creation of informal campsites would be reduced, a minor beneficial effect. Development and routine maintenance of facilities, including installation and maintenance of roads, trails, and developed sites within the park would also disturb vegetation locally due to the presence of work crews and clearing of vegetation. These activities would have long-term localized negligible adverse impacts on vegetation.

Designating Natural Area / Recreation Zones in the basic core or center of the park and the Palmer Creek Unit would eliminate the use of recreational vehicles; this would reduce erosion and the loss of native plants caused by vehicles being driven on or off two-track roads in these areas. There would be a long-term beneficial effect on vegetation from these actions, depending on the number of vehicles being used in those areas. Designating a research zone might eliminate soil erosion and native plant loss from a few vehicles being driven there, resulting in a beneficial effect.

Adding outdoor classrooms, waysides, interpretive trails, a learning center, backcountry guided tours, and visitor contact stations would benefit park vegetation by improving visitor

education. With increased visitor appreciation of native and rare plants, adverse effects on vegetation would be reduced. One beneficial effect of such education would be to help avert the spread of exotic species from visitors walking in the park. The presence of the learning center and the research zone could help encourage research that would benefit the protection and management of the park's vegetation. However, there also would be the potential for the trampling and loss of some rare plants along short interpretive trails.

Most native vegetation in Badlands National Park would continue to be protected and sustain itself under alternative B. The loss of native vegetation would be reduced by better protection, and native vegetation would benefit from designating campsites, trails, and routes, eliminating the use of recreational vehicles from some areas, and increasing education and interpretation. The short- to long-term beneficial and adverse effects on native vegetation from alternative B would be negligible to moderate.

Cumulative Effects. Other past, present, and anticipated future projects that would contribute both adverse and beneficial impacts on vegetation include: (1) the cleanup of the former Bombing Range; (2) resource management actions under the North Unit GMP/EIS; (3) management of motorized vehicle use under the Nebraska National Forest Travel Management Plan; (4) the Mni Wiconi water project; (5) the proposed DM&E rail line; (6) the proposed Crazy Horse Scenic Byway; and (7) potential wind power development projects.

Short-term to long term minor adverse impacts to vegetation would result from the loss or alteration of vegetation during construction activities in the South Unit, such as the Mni Wiconi water project, the proposed DM&E rail line, and the proposed Crazy Horse Scenic Byway. Work at the White River Visitor Center and cleanup efforts at the Bombing Range may cause the loss of natural vegetation and have the potential to contribute to cumulative adverse impacts. Actions outside of the park, including the construction and operation of the DM&E rail line and the designation of the proposed Crazy Horse Scenic Byway, which could increase

visitation to the park, and the construction of primitive campgrounds and trails in the national grassland adjacent to the park could alter or cause the loss of native plants. These other actions, added to the developments and improvements of alternative B and a likely increase in visitation, would result in a long-term minor to moderate adverse cumulative effect on the region's native vegetation. Some vegetation would be cut and removed during construction and operation of the roadway and rail line, potential increasing invasive plant species until mitigation measures are employed. This would result in short-term negligible adverse impacts to vegetation. In addition, park maintenance operations along existing roads would continue to affect plants growing on road shoulders. Grazing in the South Unit would continue, altering the types and distribution of vegetation and slowing the restoration of the natural grassland ecosystem. The construction of the Mni Wiconi water pipeline probably would cause negligible effects on vegetation because it would be built along roads where native vegetation already has been altered. The development of wind power projects outside of the park could result in localized long-term minor adverse impacts with the removal of vegetation.

In addition to cumulative actions that have negative effects on vegetation, there are also some actions that have beneficial effects. Long-term beneficial effects on the park's vegetation would result from NPS-prescribed burning efforts, the reintroduction of native vegetation, and weed management efforts in the North Unit. A beneficial long-term effect on range condition would result from increases in prescribed burning in the adjacent Buffalo Gap National Grassland by reducing fire hazard fuel accumulations and aiding in fire suppression activities by reducing fire intensity and severity protecting existing native vegetation, as is delineated in the Land and Resource Management Plan for the Nebraska National Forest and Associated Units (USFS 2001). The resource management actions under the North Unit GMP/EIS identify desired conditions including specific vegetation conditions for management areas, to help restore native plant communities.

Additionally, the management of motorized vehicle use under the Nebraska National Forest Travel Management Plan could have long-term beneficial impacts to vegetation, due to improving resource protection practices. Those actions, when added to the effects of designating trails and routes and campsites in the park, eliminating recreational vehicle use in parts of the park, and increasing educational and interpretive efforts, and encouraging more research, would result in better protection of native vegetation and its possible increase in previously disturbed areas. All these actions would result in a long-term beneficial cumulative effect on the region's native vegetation.

Overall, when all the effects of actions in and outside of the park were added to the effects from alternative B, there would be long-term minor adverse cumulative effects impacts on vegetation. However, the actions of alternative B would add a minimal increment to this cumulative effect because the effects on vegetation resulting from alternative B would be localized and spread out over time.

Conclusion. Alternative B would have short- to long-term negligible to moderate adverse effects on vegetation associated with the development or improvement facilities and visitor services. The impacts of other past, present, and anticipated projects combined with alternative B would likely result in long-term minor adverse impacts to vegetation. However, the actions under alternative B would add a minimal increment to this cumulative impact. There would be no impairment of vegetation from implementation of alternative B.

Wildlife

Analysis. New developments, improved access, and increased visitation to parts of the park would be the primary actions affecting wildlife and their habitat under alternative B. Designation of a Natural Area/Recreation Zone on approximately 89 percent of the South Unit would improve the protection of wildlife populations and habitats by allowing recreational vehicle use only on designated access roads. This would remove a source of

wildlife disturbance from vehicles being driven on or off two-track roads. This would result in a long-term beneficial effect on wildlife populations in local areas.

Initiation of active restoration programs and integrated weed management strategies for disturbed areas would increase the amount of native habitat available to wildlife. These actions would result in localized long-term beneficial effects.

Reintroduction of bison and the sustainable management of cattle grazing with potential elimination in Range Unit 505 would restore a more native grazing regime to the South Unit. Grazing dynamics between bison, cattle, other ungulates, and prairie dogs would be modified because bison and cattle have different grazing patterns (Plumb and Dodd 1993; Steuter and Hidinger 1999). The rate of expansion of prairie dog towns could be slowed by the elimination of cattle grazing over the long term. Livestock grazing provides open areas, which facilitates colonization by prairie dogs (Uresk et al. 1981; Vermeire et al. 2004). However, the reintroduction of bison would restore a native grazer to the South Unit resulting in long-term beneficial effects.

Opening a quarry for research purposes would be accompanied by improving the existing road to the quarry west of Sheep Mountain Table, constructing a new road segment from the end of the existing quarry road to the quarry, constructing a parking area, and a paved camping area. These developments would cause the permanent loss of grassland habitat, displacing wildlife along this corridor. Prairie dog towns are located in the vicinity of these developments. Clearing vegetation in that area would result in the loss of wildlife forage and shelter. Noise from construction equipment and people would displace some wildlife and temporarily disturb prairie dogs. Most birds, mammals, and reptiles would avoid the area during the construction period, but many would return after construction ceased. Some animals, primarily invertebrates, would be unable to move out of the construction area and would be killed. The new developments along with the new road segment and improved road segment

could have a long-term minor to moderate adverse effect on area wildlife.

Increased educational and interpretive efforts under alternative B would generally benefit wildlife. The addition of waysides, guided trail rides/camping trips, eco-tours, interpretive trails, and a visitor contact station would help educate visitors, increasing their appreciation of the wildlife in the South Unit and minimizing impacts they could cause such as teaching them to avoid feeding wildlife. This would result in a long-term beneficial effect on the wildlife in the South Unit.

Alternative B would include new developments to enhance visitor access and enjoyment of the South Unit. These new developments would cause a permanent loss of some grassland habitat or sparsely vegetated areas. New developments within the interior of the park include the construction of a developed camping area with amenities, pedestrian trails, horseback trails, walk-in camping units, a backcountry ranger station and equestrian facilities. These developments would also cause the permanent loss of grassland habitat or sparsely vegetated areas. These losses would primarily affect smaller, less mobile wildlife species and species with smaller home ranges, such as invertebrates. Some reptiles, small mammals, and birds also could be displaced. The loss of habitat would result in a long-term minor adverse effect on animals near these facilities. Increased noise and human activity due to construction of new developments could temporarily displace some animals such as rodents and birds, resulting in minor short-term adverse impacts on wildlife populations in local areas.

Visitation to parts of the South Unit probably would be increased by improved access from developing and improving roadways, wayside exhibits, camping areas, pedestrian trails, and horseback trails. In turn, habitat fragmentation would increase over current levels because of more visitor use of trails and routes. Some wildlife sensitive to the presence of people — pronghorn antelope, bighorn sheep, bobcat, badger, and raptors — might be displaced from areas around these corridors during the peak high use season. These actions would result in a

minor to moderate short-term and long-term adverse impact on wildlife populations in local areas, depending on such factors as the level, duration, and type of visitor use, the season of use, and the wildlife species. Increased visitation due to new developments could indirectly affect some prairie dogs — some visitors might wander into prairie dog towns, affecting the behavior of animals in the area, but any disturbance would be temporary and the effect would be negligible to minor.

The improved and expanded quarry road and additional new road segments along the perimeter may result in some wildlife being hit by vehicles and injured or killed, resulting in indirect adverse impacts. Maintenance activities along the roadways could disturb wildlife. The extent of the effects would depend partly on the location of the roads and their design. With careful siting of the roads and the use of mitigation measures, the improved road segments would result in a long-term beneficial effect on area wildlife.

Some new facilities under alternative B, such as the designated campsites in the South Unit, probably would experience seasonal increases in wildlife populations that are attracted to people and their food, such as mice, chipmunks, and black-billed magpies. This action would result in a long-term beneficial effect on these populations in local areas.

Hunting would continue in the South Unit, but with appropriate regulation and monitoring, the adverse long-term effects on wildlife populations would be minor.

Cumulative Effects. Past, present, and anticipated projects that would contribute to impacts on wildlife include (1) resource management under the North Unit GMP/EIS; (2) resource management under the Buffalo Gap National Grassland Land and Resource Management Plan; (3) modifications to motorized travel under the Nebraska National Forest Travel Management Plan; (4) wilderness designation under the proposed *Tony Dean Cheyenne River Valley Conservation Act* of 2010; (5) Prairie Dog Management Plan activities and plague efforts; (6) training activities under the South Dakota National

Guard Training Sites (2010-2015) - Environmental Assessment; (7) construction activities associated with the Mni Wiconi water project; (8) the proposed DM&E rail line; and (9) the proposed Crazy Horse Scenic Byway. These actions would likely have short- and long-term minor adverse impacts on wildlife due to land disturbance activities from construction projects and other human uses, resulting in some mortality to wildlife, increased fragmentation of wildlife habitats, increased potential for wildlife to be displaced and reduced number of areas where wildlife could exist without people or facilities. These actions would also have long-term beneficial impacts on wildlife from improved resource management, additional protections from designation of wilderness area, and decreased impacts from motorized vehicles. Management efforts to expand prairie dogs at Buffalo Gap National Grassland and plague dusting efforts in the North Unit would have beneficial effects on the species. When the beneficial and adverse impacts of other past, present, and anticipated projects, are considered with the impacts of alternative B, there would be long-term minor adverse impacts on wildlife.

Conclusion. Alternative B would have short and long-term minor to moderate adverse impacts on wildlife, as well as short and long-term beneficial impacts. The impacts of other past, present, and anticipated projects combined with alternative B would likely result in long-term minor adverse impacts. There would be no impairment of wildlife from implementation of alternative B.

PALEONTOLOGICAL RESOURCES

Analysis. Under alternative B changes in management would increase public education activities, increase public vehicle access, and provide for increased law enforcement patrols. This alternative would provide for paleontological inventories to document and presumably preserve fossils in the South Unit. It would also allow a paleontological quarry for public education and fossil collection and preservation. Livestock grazing would continue unchecked, other than a possible future reduction in Range Unit 505. Interpretation of

paleontological resources within the context of Lakota oral history could be developed through somewhat increased interpretive opportunities. Alternative B envisions a museum and interpretation at the LHEC. In addition, alternative B anticipates improved and expanded exhibits at the White River Visitor Center. The increase in educational facilities, fossil preparation, and curatorial facilities would have a beneficial effect on fossil resources. Potential adverse effects from additional development are damage to fossil resources through construction and increased fossil poaching as a result of increased visitation.

The improvement of the existing road to the quarry area and the development of a parking area, restrooms, trailheads, and campsites would have a moderate adverse impact on fossil resources due to ground disturbance from construction activity. All of this activity would be monitored and fossils would be salvaged. However, some fossils could be lost. Increased development would also have a beneficial impact on paleontological resources due to the increased ability to promote paleontological education activities and salvage at risk fossils through the quarry process. Increased law enforcement and curatorial and paleontological staffing would have a beneficial impact on the protection of fossil resources.

Therefore, these current long term adverse impacts would be reduced into the foreseeable future under alternative B, and beneficial impacts would occur based on increased paleontological inventory, collection, preservation, law enforcement presence, and interpretation/public education.

Cumulative Effects. The primary projects and actions that could contribute to cumulative effects are summarized below.

Past, present, and anticipated projects that would contribute to impacts on paleontological resources include (1) the cleanup of the former Bombing Range; (2) resource management under the North Unit GMP/EIS; (3) actions on the Buffalo Gap National Grassland; (4) the Mni Wiconi water project; (5) the proposed DM&E rail line; (6) the proposed Crazy Horse Scenic Byway, and (7) a fossil resources protection

ordinance planned by the OST. These combined actions would likely have short and long-term moderate beneficial impacts on paleontological resources because they would provide for appropriate inventory, protection, and preservation of important fossil resources.

Conclusion. Alternative B would have the potential to result in beneficial effects on paleontological resources. This would be caused primarily by an expected reduction in illegal removal of fossils from the South Unit by visitors and collectors. Continued livestock trampling of fossils and continued weathering and mass wasting (landslides) would have an adverse impact; however, these impacts could be mitigated by continuing efforts to educate visitors about fossils, efforts to allocate existing law enforcement resources toward fossil protection, and inventories to locate and salvage fossils.

The effects on paleontological resources under alternative B are anticipated to be beneficial. Illegal fossil collecting should decrease from increased law enforcement, public education, and increased inventory. Any loss of fossils would not destroy the integrity of the park relative to paleontological resources — fossils would continue to be present throughout the park, and the park staff would continue to protect, interpret, and provide opportunities for scientific research on paleontological resources. People could come to the South Unit and enjoy its values, including its fossils.

There would be no impairment of paleontological resources from implementation of alternative B.

SOUNDSCAPES

Analysis. Impacts related to soundscapes under alternative B would primarily be a result of constructing campgrounds, visitor facilities, and paved and unpaved pedestrian and horseback trails. These construction activities would largely occur in the Natural Area/Recreation Zones of the South Unit. Impacts to soundscapes associated with these construction activities would be short-term, moderate to major, and adverse. Furthermore, construction activities

within the proposed Development Zone of alternative B, including the construction of parking lots and visitor facilities, would also have short-term, moderate to major adverse impacts on soundscapes within the South Unit.

Noise levels would be likely to increase under alternative B in several places that have been relatively quiet in the past. More visitors and vehicles would be likely at the White River Visitor Center, the proposed camping areas, pedestrian trails, horseback trails, parking areas, and the quarry, as a result of improving the existing quarry road. As a result, actions proposed under alternative B would have short-term, moderate to major adverse impacts on soundscapes within the South Unit.

Cumulative Effects. As with the No-Action Alternative, short-term minor to moderate adverse effects from noise would be caused by park construction machinery within the South Unit, including construction of the LHEC. Cleanup operations of the former Bombing Range would also likely cause short-term minor to moderate adverse effects on soundscapes within the South Unit. Outside the South Unit, the construction of the Mni Wiconi water project would generate noise that would be audible in places in the South Unit. Traffic along BIA Routes 27 and 2, and BIA 41, as well as traffic leading to the solid waste management facility at Red Shirt would continue to generate noise intrusions in the South Unit, resulting in long-term, negligible to minor adverse impacts on soundscapes within the South Unit. The potential extension of the DM&E rail line and the construction of the proposed Crazy Horse Scenic Byway could also have short-term negligible to minor adverse impacts on soundscapes within the South Unit. The development of an Air Tour Management Plan would include the development of soundscape goals, objectives, and standards and identifying appropriate measures for mitigating noise impacts. These effects, added to noise caused by visitors and park operations under alternative B, would result in short and long-term minor to moderate cumulative adverse noise effects in local areas. When these noises are combined with the sounds of visitor and administrative use in the South Unit, there could be negligible to

minor, long term, adverse cumulative impacts on soundscapes.

Conclusion. Due to construction activities proposed under alternative B, the soundscapes within the South Unit would likely change substantially in the short-term. However, in areas not identified as areas for future construction, there would continue to be long-term negligible to minor adverse effects on the park's soundscape in local areas, largely from visitation and administrative activities in developed areas. Noise from activities under alternative B added to noise from other actions within and outside the South Unit could result in short-and long-term, minor to moderate adverse cumulative effects in local areas. These effects would not be sufficient to constitute an impairment of park resources or values.

CULTURAL RESOURCES

Archeological Sites

Analysis. Under alternative B, changes in management would increase public education activities and visitor access, including construction of facilities along the perimeter and a road to the paleontological quarry site. In addition, increased law enforcement patrols would be provided. This alternative would provide for surveys and inventories of archeological resources and interpretation of Oglala Sioux history and culture. Livestock grazing would continue, with possible future reductions in one area. Current and future livestock trampling, natural weathering, and mass wasting (landslides) can adversely affect archeological sites very quickly as recent studies for Bombing Range cleanup activities have shown and other observations have shown (Rom 2010). General activities associated with the restoration of the rangeland would likely be beneficial because restoration focuses on restoring vegetation and reducing erosion. There are plans to build a LHEC and to upgrade the White River Visitor Center and construct visitor services along the perimeter of the South Unit. This could be beneficial to archeological resources in that it would increase archeological education opportunities and contacts, provide for

additional law enforcement, and provide for ongoing and long-term collection and preservation of important archeological materials. Interpretation of archeological resources within the context of Lakota oral history could be developed through somewhat increased interpretive opportunities.

Most illegal collecting probably occurs relatively close to roads where park visitors likely could take artifacts illegally, either knowingly or unknowingly. Illegal collecting is not well documented, but can be a minor to moderate adverse impact. The extent of all of the above impacts would have moderate, long-term adverse effect on the park's archeological resources. Increased inventory, monitoring, and interpretation, as well as development of management zones would reduce opportunities for artifact removal, increase the amount of inventory, facilitate National Register of Historic Places evaluations, and provide for appropriate preservation of archeological sites and materials; however continued grazing and erosion within the South Unit would have long-term moderate adverse impacts.

Therefore, these current long-term adverse impacts would be reduced into the foreseeable future under alternative B, and beneficial impacts would occur based on increased archeological inventory, collection, preservation, law enforcement presence, and interpretation/public education.

Cumulative Effects. The primary projects and actions that could contribute to cumulative effects are summarized below. These include ongoing and planned actions and projects in the park, reservation, communities, and adjacent counties.

The *2006 North Unit General Management Plan* provides for archeological inventories, collection and excavation to protect cultural resources. It also provides for a strong law enforcement presence to minimize illegal collection activities.

All proposed construction projects should include archeological resources inventories and implemented measures to protect them. If so, these projects should have a beneficial impact on

archeological resources as additional surveying would occur.

The OSPRA is pursuing Federal Highway Administration approval for the proposed 215-mile Crazy Horse Scenic Byway (Lakota Country Times, October 13, 2009 Article by Tom Katus). The byway is likely to increase visitation within the South Unit, and with this some increased cultural resource loss could occur through increased theft and pedestrian traffic trampling. This project will also add to interpretation of archeological resources and provide beneficial effects.

Conclusion. Alternative B would have the potential to result in beneficial effects on archeological resources within the South Unit. This would be caused primarily by the reduced illegal removal of archeological resources from the South Unit by visitors and collectors and increases in public education opportunities and inventories. The increased knowledge about the resource base would improve the ability of the park to manage the resources, as well as improve project planning and decision making. Impacts related to continued livestock trampling and continued weathering and mass wasting (landslides) would be long-term and moderate. Increased inventory would result in beneficial effects. For Section 106 purposes, this would constitute an adverse effect.

Other actions in and outside of the South Unit could result in an overall, cumulative beneficial impact. Most impacts to cultural resources outside of the South Unit are being addressed and mitigated through actions such as law enforcement, inventory of planned projects, and collection for study and preservation.

There would be no impairment of archeological resources from implementation of alternative B as compared to the current situation.

Museum Collections

Analysis. Under alternative B, an active paleontological quarry would be opened. All fossils collected from quarry operations and associated surveys would be prepared and curated by trained park personnel and stored in an off-site museum until the LHEC museum is

fully operational. Park personnel would collect fossils deemed to be at risk of theft or erosion and where feasible, fossils would be cast for exhibit. These specimens would also be housed in offsite repositories until the LHEC is operational. In addition, surveys and inventories of archeological resources would be developed and findings documented and the artifacts stored either at Midwest Archeological Center or the LHEC.

It is anticipated that the excavations from an active paleontological quarry would produce a large amount of specimens needing storage. The offsite facilities would be able to accommodate such a large amount of museum specimens. The current configuration for storage at the LHEC is currently unknown, but for this study, it was assumed the LHEC would be able to house all specimens from the South Unit through the life of this management plan. It is intended that the offsite storage of collections would eventually come to an end. The collection would be subject to a minor adverse impact because the collection would continue to be split between facilities for some time before the LHEC became available.

Under this alternative, it is the intention of the OST to gain control of all specimens that have been taken from the South Unit, as practical. If the Tribe is successful in that effort, it is unlikely that there would be adequate storage space for all the collection to be housed in any single facility. The collection would again be subject to a minor adverse impact because the collection would continue to be split between facilities.

Finally, the movement of fragile materials between facilities may cause the loss of materials. A minor adverse impact would result.

Cumulative Effects. Numerous museums and private parties holding archeological and fossil collections from the badlands of South Dakota exist throughout the world as a result of excavations by government agencies, universities, historical societies, and individuals over the last approximately 150 years. Known collections at the facilities in South Dakota are extensive. The collections within the park make up a small but important portion of the whole collection. The collections would be expanded

through donation, testing prior to development, excavations of sites inadvertently identified during construction work, or monitoring resource conditions in the field. In addition, active efforts would be taken to retrieve parts of the collection scattered in other museums or private collections. Other activities identified as occurring within and external to the South Unit are unlikely to add a large amount of museum specimens to the collections. Cumulative impacts are expected to be minor and adverse.

Conclusion. Items in the collections would continue to be stored and maintained, with some facilities meeting NPS museum storage standards. It is assumed for this study that the LHEC would be able to house known collections from the South Unit, but the volume of materials coming from private and other repositories may overcome storage facilities. There would be a long-term minor adverse impact on the overall preservation and usefulness of the collections. Accessibility to the collection by researchers and the public would be increased. Because there would be no major adverse effects on this resource, there would be no impairment or unacceptable impacts.

Ethnographic Resources

Analysis. Park managers would consult with the OST to develop and accomplish programs in a way that respects the beliefs, traditions, and other cultural values of the Tribe that has ancestral ties to South Unit lands. Park managers would maintain a government-to-government relationship with the Tribe to ensure a collaborative working relationship, and would consult regularly with them before taking actions that would affect natural and cultural resources that are of interest and concern to them. Access to, and use of, American Indian sacred sites by American Indian religious practitioners would be accommodated in a manner consistent with applicable law, regulations, executive orders, and policy.

Ethnographic resources, including sacred sites and traditional cultural properties, would be identified and protected from impacts associated with the implementation of this alternative through increased consultation and inventory.

As a result, there would be beneficial impacts on ethnographic resources from this alternative. Alternative B would not result in any change in access by American Indians or use of ethnographic resources sacred to the tribes. The alternative would not change the agreement that guarantees tribal members unrestricted access in perpetuity and requires their written consent to affect those sites. Consultation with tribes to identify traditional use areas would precede ground-disturbing or other activities that could affect the current use, viewshed, or perception of the resource.

Cumulative Effects. Actions inside the South Unit could affect ethnographic resources, including traditional cultural properties. Efforts to clean up the Bombing Range could alter vegetation patterns and landscapes, affecting the viewshed of a sacred site. Although surveys and cleanup plans would help to reduce the extent of these effects, the cleanup efforts could result in long-term moderate and, possibly, major adverse impacts.

The impacts of other past, present, and anticipated projects, when considered with the impacts of alternative B, would result in beneficial impacts to ethnographic resources.

For the cleanup of the Bombing Range, removal of munitions would allow safer tribal member access to important areas, providing a beneficial impact. Potential visual impacts of munitions removal would be generally short-term and limited in scope. However, certain removal methods in “high density” debris areas can result in complete removal and replacement of up to several feet of surface and subsurface soils over large areas (70 acres or more) by remote controlled heavy equipment. If such removal is necessary within the viewshed of an ethnographic resource or traditional cultural property moderate adverse visual effects could result. However, such cleanup activities would only occur after consultation with the OST (Rom 2010).

The proposed DM&E rail line, if constructed, would likely have a moderate to major adverse impact on ethnographic resources (Grassrope, pers. comm.; Whiting pers. comm.). However, consultation and inventories would be carried

out and appropriate protection measures would be implemented when possible. In most cases, if ethnographic resources are within or adjacent the DM&E project corridor, the corridor cannot be easily modified to protect them. Therefore, major long-term adverse effects would be possible.

The OSPRA is pursuing Federal Highway Administration approval for the proposed 215-mile Crazy Horse Scenic Byway (Lakota Country Times, October 13, 2009 Article by Tom Katus). The byway is likely to increase visitation within the South Unit, but without additional developed facilities negligible impact to ethnographic resources is expected, and interpretive aspects could result in beneficial impacts.

Conclusion. Alternative B would result in beneficial effects on ethnographic resources due to increased inventory and protection, and the addition of appropriate interpretation. Added to this, other actions in and outside of the park could result in a beneficial impact; and the DM&E project’s potential long-term moderate to major adverse effects. Most impacts to ethnographic resources outside of the South Unit would be addressed and mitigated through actions such as inventory of planned projects, tribal consultation, documentation and preservation. For the purposes of Section 106, the determination of effect would be no adverse effect.

Implementing alternative B would result in beneficial impacts on ethnographic resources in the South Unit. Until the completion of inventories of ethnographic resources, park managers would conduct site-specific surveys and consult as appropriate with American Indians for each development action. The park’s resources and values would not be impaired.

SCENIC RESOURCES

Analysis. Under alternative B, additional facilities would be added to the park such as improved roadways, new visitor contact and entrance structures, new small parking areas with short access roads, developed campgrounds with amenities such as restrooms, overlooks, and

interpretive signing. These facilities would increase human use in the developed areas and along roadways. These facilities and use however would be dispersed throughout the South Unit. As under the No-Action Alternative any expanded residential ranching structures would be visible in the vast open areas of the South Unit in the future. Expanding developments and activities related to ranching could generate more dust. Overall such development and activities would intrude upon the area's scenery, affecting visibility and introducing new light sources into the night sky. Such developments and land uses would be relatively small in scale and would have negligible to minor, long-term, localized, adverse impacts on scenery.

With the addition of trailheads more people would be dispersed throughout the park along trails for hikers and horseback use. These types of use can cause soil erosion and airborne dust particles that tend to linger in the air for short periods, affecting visibility. Overall, limited and highly dispersed new facilities and activities in areas of development would have short-term and long-term, localized, negligible to minor impacts on scenery and visibility.

New sources of outdoor light associated with new structures such as campgrounds, visitor contact stations and entrance stations and expanding visitor center would be introduced. These sources of light would be minimal. Public activities would generally be scheduled for daylight hours, and any new lighting needs would be minimized. Impacts on night sky from the implementation of Alternative B would be negligible to minor, long term, and adverse.

Cumulative Impacts. Rehabilitation of the main park roads and parking areas and the addition of the facilities would increase the capacity of the park by an estimated 15 to 20 percent. This would result in a negligible, long-term, localized, adverse impact on the scenic resources of the park. Community and commercial-scale renewable energy development on the Pine Ridge Indian Reservation could have major adverse impacts on the scenic resources of the South Unit, permanently altering the panoramic vistas with

the construction of wind turbines and/or solar panels on sites adjacent to the South Unit.

Overall, the development proposed under this alternative would intrude on the area's natural scenery, affect visibility, and introduce new light sources into the night sky. Combined with other past, present, and reasonably foreseeable future impacts, impacts generated as a result of implementing alternative B would be long term, minor to major, and adverse.

Conclusion. Alternative B would have negligible to major, short-and long-term, localized, adverse impacts on scenery, visibility, and night sky. There would be no impairment of scenic resources and visual quality from this alternative.

VISITOR EXPERIENCE

Access

Analysis. Alternative B primarily focuses on expanded access and opportunities for visitors to the South Unit.

Developed perimeter access would be focused in one location with trails, trailheads, parking areas, rest areas with comfort stations, overlooks, and wayside exhibits. Visitors could explore the South Unit at dispersed visitor access points along the perimeter. The existing road to the quarry area would be improved and would include parking, restrooms, trailheads, and campsites. Existing two-track roads would continue to provide access to the South Unit. The main roads in the South Unit would be improved.

Recreational opportunities would be available through guided trail rides, and hiking trails and camping sites would be established. Hiking would be allowed on some primitive trails. Primitive camping would allow for unguided camping experiences, and limited overnight backpacking by permit. Visitors could plan and schedule backcountry camping trips at a backcountry contact station / visitor center. Guided horse camping trips would be offered.

Hiking and horseback riding trails would be developed, along with trailheads with parking,

comfort facilities, interpretive signs, and informational signage. A mountain biking trail might be developed. Biking along the roads would be encouraged in places where bike lanes could be established.

Access would be afforded through the means identified above, thus restricting unguided access to ceremonial and other cultural sites of the South Unit. Thus, beneficial impacts on visitor access would result from improvement of local roads, construction of new parking lots, guided and unguided tours to the backcountry, increased camping opportunities, and improved signage on surrounding roads.

Cumulative Effects. Traffic projections indicate that a substantial increase in park visitation could result from the completion of the Heartland Expressway and the proposed Crazy Horse Scenic Byway. The increase from these roads originating from the south and west, added to visitation projections, could alter the current visitation patterns to the park. The routes for these two road projects already exist, but typically park visitors do not use them. Visitor access to the park's South Unit would be improved by the upgrading of the roads and by their being emphasized with designations.

Conclusion. By improving access in the South Unit, alternative B would produce a beneficial effect on visitor access. The improvement in access would come from improvement of local roads, construction of new parking lots, guided and unguided tours to the backcountry, increased camping opportunities, and improved signage on surrounding roads.

Availability of Information

Analysis. Under alternative B, interpretation would be available at some cultural sites across the South Unit, and programs offered by tribal members would focus on aspects of Oglala history and culture. Historical exhibits would remain on display at the White River Visitor Center, which would be staffed by Tribal employees. The NPS would design the exhibits with OST input. However, under alternative B, interpretive opportunities would be offered to visitors in a variety of new ways:

- Historic and cultural interpretive opportunities would include activities such as powwows and ceremonies. At some cultural or ceremonial sites, as well as at campgrounds, interpretive activities would be presented so visitors could learn more about the Lakota culture and history. Programs would feature tribal members who wear and explain traditional dress, and storytelling and oral history would be presented by tribal elders.
- Oglala guides would conduct travel into the backcountry and less-developed areas. The guides would interpret natural resources, the history of the area, Oglala culture, and traditional Lakota land management.
- Interpretation of the Bombing Range would continue.
- Paleontology digs, monitored by trained park personnel, might be observed by visitors, and outdoor classrooms might be offered by the staff.
- Interpretive signs would be placed along roads to identify locations, animals and plants, historic locations, and mileages.
- The exhibits at the White River Visitor Center would be improved and expanded and there would be a working museum with a hands-on education section. An entrance station and visitor contact station would also be constructed in the vicinity of the White River Visitor Center. A visitor contact station would also be developed on the west side of the South Unit. Interpretation and orientation information would also be available at the LHEC.

As a result of the expanded interpretive programs and signage, adding the visitor contact station at the White River Visitor Center and a new learning center and having park information available from outside sources (Tribal members) under alternative B, there would be beneficial impacts on availability of information about park resources.

Cumulative Effects. The LHEC would be an additional outlet disseminating information to the public. The development of the proposed interpretive trails under the Nebraska National Forest Land and Resource Management Plan could also provide additional opportunities to disseminate information to visitors. These projects would produce beneficial effects on the availability of information for visitors.

Conclusion. Alternative B would result in beneficial effects on the availability of information about the park. The increase in the number of outlets where visitors could obtain information and the dispersed locations of these outlets would substantially improve the visitor experience.

Range and Enjoyment of Visitor Activity

Analysis. Vehicle use, hiking and pack stock use, camping, and picnicking are the four most popular activities.

Vehicle Use. Under alternative B, developed perimeter vehicular access would be focused in one location with trails, trailheads, parking areas, rest areas with comfort stations, overlooks, and wayside exhibits. Visitors would be able to explore the South Unit at dispersed visitor access points along the perimeter. The existing road to the quarry area would be improved and would include parking, restrooms, trailheads, and campsites. Existing two-track roads would continue to provide access to the South Unit, and the main roads in the South Unit would be improved. Therefore, beneficial impacts would result from the development of new facilities, trails, and roads, and would allow more visitors and vehicles in previously inaccessible areas.

Hiking and Pack Stock. Developing trailheads and designating trails in the Natural Area / Recreation Zone would substantially increase opportunities for hiking and pack stock users. Many visitors are reluctant to explore the backcountry except in areas with designated trails or routes. The designation of new routes would expand opportunities beyond the limited number of trails now in the South Unit. Designating trails, increasing hiking

opportunities, and adding trailer parking areas would result in beneficial effects on the visitor experience.

Camping. Under alternative B, a total of four new camping areas would be developed. Specific locations for the camping areas would be determined based on park management recommendations, but the general locations would be: one camping area with amenities on the perimeter of the South Unit; one camping area with amenities in the interior area for guided trips; one camping area, consisting of 15 primitive walk-in units, in the interior; and one paved 15-unit camping area with a 2-unit toilet and a trailhead in the vicinity of the quarry area. Primitive camping opportunities would allow for unguided camping experiences, and limited overnight backpacking by permit. As a result of the expanded camping opportunities offered, alternative B would have beneficial impact to camping.

Picnicking. New picnic areas would be developed on the west side of the South Unit (near the Red Shirt Table overlook), at the proposed visitor contact center, at the improved area at the White River Visitor Center, and at other appropriate areas to be identified by park staff. As a result, alternative B would have beneficial impacts to picnicking opportunities.

Cumulative Effects. It is projected that various plans for road improvements in the region would increase opportunities for driving and sightseeing. If the proposed Crazy Horse Scenic Byway were designated and marked by signs, it would offer an additional scenic driving opportunity in the region. The management plan for Buffalo Gap National Grassland calls for the development of a primitive campground near the South Unit, expanding the region's camping opportunities (USFS 2001). These projects would result in beneficial impacts for visitors seeking recreational opportunities in the region.

Conclusion. There would be more opportunities throughout the park and vicinity for visitors seeking to drive/sightsee, hike, camp, and/or picnic, creating beneficial effects on such visitors.

SOCIOECONOMICS

Analysis. Implementation of alternative B would be expected to lead to an increase in expenditures on staff and operations over the No-Action Alternative. The total number of staff needed under this alternative would be expected to increase by 23 full-time positions at a cost of \$3.3 million per year. In addition, implementation of this alternative would be expected to generate additional expenditures for the construction or rehabilitation of facilities and development of a number of studies and plans, all of which are considered one-time costs. Ongoing operations would bring well-paying, permanent employment opportunities to a traditional, economically depressed area which could have noticeable economic benefits. In addition, one-time construction and plan and study costs could also generate minor to moderate economic impacts throughout the larger study region, though these impacts are expected to be short-term. This infusion of federal agency spending into the economy would likely generate additional economic activity in terms of jobs and income. The intensity of these impacts would depend on the ability of local firms to have the necessary skills and expertise to meet the requirements of the construction and study projects.

Visitation under alternative B would be expected to increase over the long-term with the expansion of programs, opportunities and facilities at the South Unit. Increases in visitation could lead to increased visitor spending in the local and regional economies as more visitors are spending money while visiting the area or extending their time in southwestern South Dakota. Sustained increases in visitation to the South Unit may also generate additional economic development outside park boundaries which would generate additional economic benefits to a traditionally economically depressed region.

Implementation of alternative B could also cause minor adverse economic impacts as grazing activities are eliminated from Range Unit 505.

Cumulative Impacts. Past, present, and anticipated projects that would contribute to impacts on socioeconomics include (1) the

cleanup of the former Bombing Range; (2) resource management under the North Unit GMP/EIS; and (3) approval of the proposed Crazy Horse Scenic Byway. These combined actions would likely be beneficial impacts on socioeconomics due to increased access and exposure to the opportunities at the South Unit. The cumulative effects of all these projects could lead to additional visitation to the South Unit potentially generating additional economic benefits through increased visitor spending. The impacts of other past, present, and anticipated projects, when considered with the impacts of Alternative B, would result in short- and long-term minor impacts on socioeconomics.

Conclusion. The socioeconomic effect of operations and visitor use at the South Unit under alternative B would be expected to have beneficial economic impacts.

PARK OPERATIONS

Analysis. Staffing levels would increase to approximately 25 full-time positions to implement the actions of alternative B. Under this alternative it is estimated that the park would need an annual operating budget increase of approximately \$3.3 million to operate the South Unit once the alternative is fully implemented. This would result in expanding a wide range of recreation opportunities, improving interpretation and education, and improving resource protection, law enforcement, and administration. This would also lead to better services and programs, such as developing an education and outreach program. Expanded staff levels would be ready to face future changes. Knowing the value of promoting volunteers in the park in view of continual shrinking budgets, major emphasis would also be placed on interagency volunteer coordination, which would efficiently leverage partnerships and volunteers to achieve the purposes of the park. Programs to involve volunteers in inventory, monitoring, interpretation and outreach, cultural resource data collection, resource restoration, area or campground hosting, trail patrol, light maintenance, and other aspects of park operations would be continued and expanded. The effects on the South Unit would be beneficial and long term.

Cumulative Impacts. There would continue to be a strong demand for the recreational opportunities that the South Unit would offer as well as those associated with nonprofit organizations and volunteers to be partners in managing all federal lands, not just those of the NPS. The region and the country at large has a strong and growing population of highly skilled, senior population with outside sources of income, who tend to volunteer and would likely be able to supply adequate volunteer services. Even with increasing demands, better organization and use of volunteers would keep supply abreast with demand and benefit park operations.

Conclusion. A clear plan of action and increased staff to implement those actions would result in highly effective park operations and coordination of partners and volunteers to protect resources and serve visitors. The effect would be beneficial.

UNAVOIDABLE ADVERSE IMPACTS

Under alternative B, the activities related to the construction of additional facilities as well as human use, would result in minor adverse impacts on natural resources in some areas of the South Unit. Although these impacts (e.g., soil compaction, vegetation trampling, wildlife disturbances, and decreased opportunities for solitude) would be unavoidable, mitigation to reduce them would be carried out where possible. The impacts on wildlife, vegetation, and visitor experience are discussed in detail for the specific impact topics.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Under alternative B, there would be a commitment of land, raw materials, and consumption of fuels associated with the construction of the new visitor and administrative facilities as described in detail

in —Chapter 3: Alternatives, Including the Preferred Alternative.” These energy requirements, raw materials and land requirements to construct new facilities represent an irretrievable commitment of resources.

RELATIONSHIP OF SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

Most of the South Unit would be managed as a Natural Area/Recreation Zone (approximately 89 percent) and would maintain its long-term productivity. A small percentage of the South Unit would be converted to a Development Zone (approximately 11 percent) along the perimeter. The quarry would be managed as a Research Zone (less than 1 percent).

Under alternative B there would be new highly developed visitor and administrative facilities constructed in the Development Zone as well as more primitive facilities for the same purpose within the Natural Area/Recreation Zone. There would be some localized loss of ecological productivity as a result. Actions would be taken to minimize adverse effects on the long-term productivity of biotic communities. The proposed developments within both zones could reduce ecological productivity in some localized areas as a result of construction and increased use.

Short-term impacts might result from construction of new visitor and administrative facilities to resources such as local water pollution, as detailed in the analysis of specific impact topics. Noise and human activity from construction might displace some wildlife from the immediate area. However, these activities would not jeopardize the long-term productivity of the environment except in areas occupied by new facilities. Proposed actions would also yield long-term benefits from a visitor experience perspective.

IMPACTS OF ALTERNATIVE C: FOCUS ON RESOURCE PROTECTION/PRESERVATION

NATURAL RESOURCES

Vegetation

Analysis. Similar to alternative B, under alternative C vegetation would be lost or altered in local areas, primarily from the development or improvement of facilities and visitor services. Most new developments or improvements would be placed within the existing footprint of disturbed areas where the vegetation already has been altered; therefore, little additional loss of native vegetation would result from construction or improvement activities related to the White River Visitor Center. With the use of appropriate mitigation measures to minimize impacts (such as ensuring that equipment stays within project area boundaries, revegetating disturbed areas with native vegetation, avoiding known or possible locations for special-status plant species, and taking steps to avoid the spread of exotic species), there would be short- to long-term negligible to minor adverse effects on native vegetation from these actions.

The elimination of livestock grazing in Range Unit 505 would have an influence on the distribution of some plant species and plant associations resulting in beneficial and short- to long-term negligible adverse effects on vegetation. Moderate grazing reduces mean annual aboveground production of mixed grass prairie only a little but can result in a shift in the relative composition of cool and warm season grasses (Plumb and Dodd 1993). Livestock grazing in the South Unit influences not only the grassland composition but also exotic species distribution. Whereas some nonnative species may actually increase under grazing pressure (e.g., Canada thistle), yellow sweetclover appears to be controlled by grazing. For example, yellow sweetclover occurs in greater abundance on ungrazed lands of the North Unit versus similar grazed lands in the South Unit. Conversely, blue grama/buffalo grass grasslands tend to be absent within the lightly grazed or

ungrazed lands of the North Unit (Bureau of Reclamation 1999).

The elimination of livestock grazing and the introduction of bison to the South Unit would result in beneficial effects and short- to long-term negligible to minor adverse impacts to vegetation. The introduction of bison could create a shift in the composition and structure of native vegetation in South Unit. Cattle and bison are considered generalist foragers, yet differences in food habits indicate that cattle are more selective foragers than bison. Bison tend to avoid patches dominated by forbs and browse while cattle select more strongly for these forages. Forage selection by bison varies with changes in forage quality and abundance. Evidence suggests that bison graze heavily on a local scale, which when combined with secondary effects such as wallowing, trampling, and rubbing, create a vegetation mosaic resulting in beneficial effects on vegetation. Foraging by cattle is highly associated with temporal and spatial patterns of higher forage quality and/or quantity. Bison respond to spatial and temporal variation in forage quality by selecting for higher quality and thus influence function and structure (Anderson 2006). Additionally wallowing by bison directly impacts late-successional perennial vegetation and provides a refuge for flora different from that of the surrounding grassland. Bison also show greater affinity for rubbing, resulting in substantial physical damage to individual woody plants.

As under alternative B, constructing the new parking lots and the 800 yards of paved roadway would cause both direct and indirect adverse effects on prairie vegetation. Native grassland vegetation would be lost or damaged during siting, construction, and maintenance of the parking lots and roadway. Some rare plants could be lost, although it might be possible to locate the parking areas and road to avoid those plants. Some native plants would be permanently lost because of the parking lot or road footprint. Nonnative plants could be introduced or spread into disturbed areas. Even

with mitigation measures, construction equipment in the project area would result in the damage or loss of other plants resulting in short- to long-term negligible to minor adverse impacts to vegetation.

Vegetation would be altered or lost through increased visitation under alternative C. As under alternatives A and B, people walking over and trampling plants in and around existing facilities would result in the loss of native vegetation. However, due to the minimal amount of development and the preservation of park lands and native vegetation there would be negligible minor impacts to vegetation.

The new entrance station, backcountry ranger station and equestrian facilities, restrooms, and camping areas would be built in previously undisturbed areas. Despite the use of mitigation measures to help reduce the loss of native prairie vegetation, some vegetation would be permanently disturbed or lost in these areas resulting in a long-term minor adverse impact.

As soils would be affected, building or designating new trails and routes would cause both beneficial and adverse effects for the park's vegetation. Hiker and pack stock use would increase on new trails on the perimeter and the interior, resulting in the trampling and loss of vegetation. More erosion in any of these areas would cause the loss of some plants, and the potential for visitors or pack stock to inadvertently carry in and spread exotic species also would increase. Developing a trailhead in the South Unit could encourage more four-wheel-drive use of the unimproved roads in this area, which in turn could increase erosional impacts and native plant loss. If more pack stock used this area, there would be increased potential for the spread of exotic species. Depending on the level of use, time of use, and the vegetation, there could be a minor to moderate long-term adverse impact on vegetation in local areas.

Designating campsites along the primitive roads in the South Unit would increase use in these areas so that some native vegetation probably would be trampled or lost. However, the loss of vegetation from indiscriminate camping and from the creation of informal campsites would

be reduced, a beneficial effect. Development and routine maintenance of facilities, including installation and maintenance of roads, trails, and developed sites within the park would also disturb vegetation locally due to the presence of work crews and clearing of vegetation. These activities would have long-term localized negligible adverse impacts on vegetation.

Designating Natural Area / Recreation Zones in the southwest corner of the park and the Palmer Creek Unit and a large Preservation Zone would eliminate the use of recreational vehicles; this would reduce erosion and the loss of native plants caused by vehicles being driven on or off two-track roads in these areas.

Adding waysides in the southeast corner of the park and the Palmer Creek Unit, interpretive trails, a learning center, backcountry guided tours, and visitor contact stations would benefit park vegetation by improving visitor education. With increased visitor appreciation of native and rare plants, adverse effects on vegetation would be reduced. One beneficial effect of such education would be to help avert the spread of exotic species from visitors walking in the park. The presence of the learning center and the research zone could help encourage research that would benefit the protection and management of the park's vegetation. However, there also would be the potential for the trampling and loss of some rare plants along short interpretive trails.

Most native vegetation in the South Unit would continue to be protected and sustain itself under alternative C. The loss of native vegetation would be reduced by better protection, and native vegetation would benefit from designating campsites, trails, and routes; eliminating the use of recreational vehicles from some areas; and increasing education and interpretation. The beneficial and adverse effects on native vegetation from alternative C would be negligible to moderate.

Cumulative Effects. Other past, present, and anticipated future projects that would contribute both adverse and beneficial impacts on vegetation include (1) the cleanup of the former Bombing Range; (2) resource management actions under the North Unit GMP/EIS;

(3) ongoing prairie dog plague management efforts; (4) management of motorized vehicle use under the Nebraska National Forest Travel Management Plan; (5) major rehabilitation of Loop Road 240; (6) the Mni Wiconi water project; (7) the proposed DM&E rail line; (8) the proposed Crazy Horse Scenic Byway and (9) potential wind power development projects.

Short-term to long term minor adverse impacts to vegetation would result from the loss or alteration of vegetation during construction activities in the South Unit, such as the Mni Wiconi water project, the proposed DM&E rail line, and the proposed Crazy Horse Scenic Byway. Work at the White River Visitor Center area and cleanup efforts at the Bombing Range may cause the loss of natural vegetation and have the potential to contribute to cumulative adverse impacts. Actions outside of the park, including the construction and operation of the DM&E rail line and the designation of the proposed Crazy Horse Scenic Byway, which could increase visitation to the park, and the construction of primitive campgrounds and trails in the national grassland adjacent to the park could alter or cause the loss of native plants. These other actions, added to the developments and improvements of alternative C and a likely increase in visitation, would result in a long-term minor to moderate adverse cumulative effect on the region's native vegetation. Some vegetation would be cut and removed during construction and operation of the roadway and rail line, potentially increasing invasive plant species until mitigation measures are employed. This would result in short-term negligible adverse impacts to vegetation. In addition, park maintenance operations along existing roads would continue to affect plants growing on road shoulders. Grazing in the South Unit would continue, altering the types and distribution of vegetation and slowing the restoration of the natural grassland ecosystem. The construction of the Mni Wiconi water pipeline probably would cause negligible effects on vegetation because it would be built along roads where native vegetation already has been altered. The development of wind power projects outside of the park could result in localized long-term

minor adverse impacts with the removal of vegetation.

In addition to cumulative actions that have negative effects on vegetation, there are also some actions that have beneficial effects. Beneficial effects on the park's vegetation would result from prescribed burning efforts, the reintroduction of native vegetation, and weed management efforts. A beneficial effect on range condition would result from increases in prescribed burning in the adjacent Buffalo Gap National Grassland by reducing fire hazard fuel accumulations and aiding in fire suppression activities by reducing fire intensity and severity protecting existing native vegetation, as is delineated in the Land and Resource Management Plan for the Nebraska National Forest and Associated Units (USFS 2001). The resource management actions under the North Unit GMP/EIS identify desired conditions including specific vegetation conditions for management areas, to help restore native plant communities. Additionally, the management of motorized vehicle use under the Nebraska National Forest Travel Management Plan could have beneficial impacts to vegetation, due to improving resource protection practices. Those actions, when added to the effects of designating trails and routes and campsites in the park; eliminating recreational vehicle use in parts of the park; and reintroducing native plants to disturbed areas, would result in better protection of native vegetation and its possible increase in previously disturbed areas. All these actions would result in a beneficial cumulative effect on the region's native vegetation.

Overall, when all the effects of actions in and outside of the park were added to the effects resulting from alternative C, there would be long-term minor adverse cumulative effects on the park's vegetation. However, the actions of alternative C would add a minimal increment to this cumulative effect because the effects resulting from alternative C would be localized and spread out over time.

Conclusion. Alternative C would have short- to long-term adverse and beneficial effects on vegetation resulting in negligible to moderate adverse effects on vegetation associated with the

development or improvement facilities and visitor services. The impacts of other past, present, and anticipated projects combined with alternative C would likely result in long-term cumulative minor adverse effects on the park's vegetation. However, the actions under alternative C would add a minimal increment to this cumulative impact. There would be no impairment of vegetation from implementation of alternative C.

Wildlife

Analysis. New developments, improved access, and increased visitation to parts of the park would be the primary actions affecting wildlife and their habitat under alternative C. Designation of a Preservation Zone approximately 77 percent and a Natural Area/Recreation Zone approximately 21 percent of the South Unit would improve the protection of wildlife populations and habitats by eliminating private vehicle access in that area. This would remove a source of wildlife disturbance from vehicles being driven on or off two-track roads, resulting in a beneficial effect on wildlife populations in local areas.

Initiation of active restoration programs and integrated weed management strategies for disturbed areas would increase the amount of native habitat available to wildlife. These actions would result in localized beneficial effects.

Reintroduction of bison into Range Unit 505 to create a preserve/reserve and the sustainable management of cattle grazing with potential long-term elimination in the South Unit would restore a more native grazing regime. Grazing dynamics between bison, cattle, other ungulates, and prairie dogs would be modified because bison and cattle have different grazing patterns (Plumb and Dodd 1993; Steuter and Hiding 1999). The rate of expansion of prairie dog towns could be slowed by the elimination of cattle grazing over the long-term. Grazing provides open areas, which facilitates colonization by prairie dogs (Uresk et al. 1981; Vermeire et al. 2004). However, the reintroduction of bison would restore a native grazer to the South Unit resulting in beneficial effects.

Increased educational and interpretive efforts under alternative C would generally benefit wildlife. The addition of waysides, guided trail rides/camping trips, interpretive trails, and a visitor contact station would help educate visitors, increasing their appreciation of wildlife at the South Unit and minimizing impacts they could cause, such as by teaching them to avoid feeding wildlife. This would result in a beneficial effect on the wildlife at the South Unit.

Alternative C would include new developments to enhance visitor access and enjoyment of the South Unit. New developments along the perimeter would cause a permanent loss of some grassland habitat and sparsely vegetated areas. New developments within the interior of the park include the construction of primitive camping areas, pedestrian trails, horseback trails, and a backcountry ranger station and equestrian facilities. These developments would also cause the permanent loss of grassland habitat and sparsely vegetated areas. These losses would primarily affect smaller, less mobile wildlife species and species with smaller home ranges, such as invertebrates. Some reptiles, small mammals, and birds also could be displaced. The loss of habitat would result in a long-term minor adverse effect on animals near these facilities. Increased noise and human activity due to construction of new developments could temporarily displace some animals such as rodents and birds, resulting in minor short-term adverse impacts on wildlife populations in local areas.

Visitation to parts of the park probably would be increased by improved access from developing and improving roadways, wayside exhibits, camping areas, pedestrian trails, and horseback trails. In turn, habitat fragmentation would increase over current levels because of more visitor use of trails and routes. Some wildlife sensitive to the presence of people — pronghorn antelope, bighorn sheep, bobcat, badger, and raptors — might be displaced from areas around these corridors during the peak high use season. These actions would result in a minor to moderate short-term and long-term adverse impact on wildlife populations in local areas, depending on such factors as the level, duration,

and type of visitor use, the season of use, and the wildlife species. Increased visitation due to new developments could indirectly affect some prairie dogs — some visitors might wander into prairie dog towns, affecting the behavior of animals in the area, but any disturbance would be temporary and the effect would be negligible to minor.

New road segments along the perimeter may result in some wildlife being hit by vehicles and injured or killed, resulting in indirect adverse impacts. Maintenance activities along the roadways could disturb wildlife. The extent of the effects would depend partly on the location of the roads and their design. With careful siting of the roads and the use of mitigation measures, the roads would result in a long-term minor to moderate adverse effect on area wildlife.

Some new facilities under alternative C, such as the primitive campsites in the South Unit, probably would result in seasonal increases in wildlife populations that are attracted to people and their food, such as mice, chipmunks, and black-billed magpies. This action would result in a beneficial effect on these populations in local areas.

Hunting could increase in the South Unit with improved access, resulting in more animals being harvested, but with appropriate regulation and monitoring, the adverse effects on wildlife populations would be minor.

Cumulative Effects. Past, present, and anticipated projects that would contribute to impacts on wildlife include (1) resource management under the North Unit GMP/EIS; (2) resource management under the Buffalo Gap National Grassland Land and Resource Management Plan; (3) modifications to motorized travel under the Nebraska Travel Management Plan FEIS; (4) wilderness designation under the proposed *Tony Dean Cheyenne River Valley Conservation Act* of 2010; (5) Prairie Dog Management Plan activities and plague efforts; (6) training activities under the South Dakota National Guard Training Sites (2010-2015) Environmental Assessment; (7) construction activities associated with the Mni Wiconi water project; (8) the proposed DM&E rail line; and

(9) the proposed Crazy Horse Scenic Byway. These actions would likely have short and long-term minor adverse impacts on wildlife due to land disturbance activities from construction projects and other human uses which would result in some mortality to wildlife, increased fragmentation of wildlife habitats, increased potential for wildlife to be displaced and reduced number of areas where wildlife could exist without people or facilities. These actions would also have beneficial impacts on wildlife from improved resource management, additional protections from designation of wilderness area, and decreased impacts from motorized vehicles. Management efforts to expand prairie dogs at Buffalo Gap National Grassland and plague dusting efforts in the North Unit would have beneficial effects on the species. When the beneficial and adverse impacts of other past, present, and anticipated projects are considered with the impacts of alternative C, there would be long-term minor adverse impacts on wildlife.

Conclusion. Alternative C would have short and long-term minor to moderate adverse impacts to wildlife; as well as beneficial impacts. The impacts of other past, present, and anticipated projects combined with alternative C would likely result in long-term minor adverse impacts. There would be no impairment of wildlife from implementation of alternative C.

PALEONTOLOGICAL RESOURCES

Analysis. Alternative C focuses on fossil resource protection. Changes in proposed management would increase public education activities, reduce public vehicle access, and provide for increased law enforcement patrols. Alternative C would provide for paleontological inventories for planned projects and the location, documentation, and preservation of fossils in the South Unit. Paleontologists, fossil preparators, and park curators would be hired to manage and implement these activities. Livestock grazing would gradually be eliminated from the South Unit. Interpretation of paleontological resources within the context of Lakota oral history could be developed through increased interpretive opportunities that focus on Lakota and OST Tribal beliefs. There would be a focus on elders

and spiritual leaders and their oral history about fossil resources. In addition, visitor activities would be restricted to the perimeter, reducing the potential for theft or inadvertent damage of fossils.

There are plans to build a LHEC on land close to the South Unit. In addition, alternative C includes the upgrade of the White River Visitor Center. The increase in educational facilities, fossil preparation, and curatorial facilities would have a beneficial effect on fossil resources.

Therefore, the current long-term adverse impacts would be reduced in the foreseeable future under alternative C, and beneficial impacts would occur based on increased paleontological inventory, collection, preservation, law enforcement presence, availability of appropriate personnel, and interpretation/public education.

Cumulative Effects. The primary projects and actions that could contribute to cumulative effects are summarized below.

Conclusion. Alternative C would have potential beneficial effects on paleontological resources. This would be caused primarily by an expected reduction in illegal removal of fossils from the South Unit by visitors and collectors and reduced livestock trampling of fossils. However, the reintroduction of bison could have an adverse impact through increased trampling of fossils.

Impacts could be mitigated by continuing efforts to educate visitors about fossils, efforts to allocate existing law enforcement resources toward fossil protection, inventories to locate and protect fossils, and availability of professional personnel. Added to this, other actions in and outside of the park could result in a cumulative beneficial impact. Most impacts to fossil resources outside of the South Unit are being addressed and mitigated through actions such as law enforcement, inventory of planned projects, and collection for study and preservation.

The effects on paleontological resources under alternative C are anticipated to be beneficial. Illegal fossil collecting should decrease from increased law enforcement, and increased inventory. Any loss of fossils, reduced from

current levels would not destroy the integrity of the park relative to paleontological resources—fossils would continue to be present throughout the park, and the park staff would continue to protect, interpret, and provide opportunities for scientific research on paleontological resources. People still could come to the South Unit and enjoy its values, including its fossils.

There would be no impairment of paleontological resources from implementation of alternative C.

SOUNDSCAPES

Analysis. Impacts related to soundscapes under alternative C would primarily be a result of constructing campgrounds, backcountry facilities, and access to unpaved pedestrian and horseback trails. These construction activities would largely occur in the Natural Area/Recreation Zones of the South Unit, which would be contained to the southwest corner of the park and the Palmer Creek Unit. Impacts to soundscapes associated with these construction activities would be short-term, moderate, and adverse. Furthermore, construction activities within the proposed Development Zone of alternative C, located on the southeast portion of the South Unit, including the construction of parking lots and visitor facilities, would also have short-term, moderate adverse impacts on soundscapes within the South Unit.

Cumulative Effects. As with the No-Action Alternative, short-term minor to moderate adverse effects from noise would be caused by park construction machinery within the South Unit, including construction of the LHEC. Cleanup operations of the former Bombing Range would also likely cause short-term minor to moderate adverse effects on soundscapes within the South Unit. Outside the South Unit, the construction of the Mni Wiconi water project would generate noise that would be audible in places in the South Unit. Traffic along BIA Routes 27 and 2, and BIA 41, as well as traffic leading to the solid waste management facility at Red Shirt would continue to generate noise intrusions in the South Unit, resulting in long-term, negligible to minor adverse impacts on soundscapes within the South Unit. The

potential extension of the DM&E railroad and the construction of the proposed Crazy Horse Scenic Byway could also have short-term negligible to minor adverse impacts on soundscapes within the South Unit. These effects, added to noise caused by visitors and park operations under alternative C, would result in short and long-term minor to moderate cumulative adverse noise effects in local areas. When these noises are combined with the sounds of visitor and administrative use in the South Unit, there could be negligible to minor, long term, adverse cumulative impacts on soundscapes.

Conclusion. Due to the construction activities proposed under alternative C, the soundscapes within the South Unit would likely change considerably in the short-term. However, in areas not identified as areas for future construction, there would continue to be long-term negligible to minor adverse effects on the park's soundscape in local areas, largely from visitation and administrative activities in developed areas. Noise from activities under alternative C added to noise from other actions within and outside the South Unit could result in short-and long-term, moderate adverse cumulative effects in local areas. These effects would not be sufficient to constitute an impairment of park resources or values.

CULTURAL RESOURCES

Archeological Sites

Analysis. Under alternative C, focusing on archeological resource protection, changes in proposed management would increase public education activities, reduce public vehicle access, and provide for increased law enforcement patrols. Alternative C would provide for archeological inventories for planned projects and the location, documentation, and preservation of archeological resources in the South Unit. Databases would be prepared to aid in cultural resource management. An archeological resources management plan and a curatorial management plan would be completed. Livestock grazing would continue, but would eventually be phased out. These

activities associated with the restoration of the rangeland would likely be beneficial because restoration focuses on restoring vegetation and reducing erosion. Interpretation of archeological resources within the context of Lakota oral history could be developed through increased interpretive opportunities that focus on Lakota and OST Tribal beliefs. There would be a focus on elders and spiritual leaders and their oral history about archeological resources. Visitor activities would be restricted primarily to the perimeter, reducing the potential for theft or inadvertent damage of archeological materials.

Therefore, beneficial impacts would occur based on increased archeological inventory, collection, preservation, law enforcement presence, availability of appropriate personnel, control of access to the interior by the public, and interpretation/public education. Negligible to minor adverse impacts would continue to occur from natural weathering, erosion, or landslides.

Cumulative Effects. The primary projects and actions that could contribute to cumulative effects are summarized below.

Past, present, and anticipated projects that would contribute to impacts on archeological resources include (1) the cleanup of the former Bombing Range; (2) resource management under the North Unit GMP/EIS; (3) actions on the Buffalo Gap National Grassland; (4) the Mni Wiconi water project; (5) the proposed DM&E rail line; and (6) the proposed Crazy Horse Scenic Byway. These combined actions would likely have beneficial impacts on archeological resources because they would generally provide for appropriate inventory, protection, and preservation of important fossil resources.

The impacts of other past, present, and anticipated projects, when considered with the impacts of alternative C, would result in beneficial impacts to archeological resources. All proposed construction projects should include archeological resources inventories and implemented measures to protect them. If so, these projects should have a beneficial impact on archeological resources as additional surveying would occur.

Conclusion. Alternative C would result in beneficial effects on archeological resources. This would be caused primarily by an expected reduction in illegal removal of archeological materials from the South Unit by visitors and collectors and reduced livestock trampling. Impacts related to continued weathering and mass wasting could be mitigated by continuing efforts to educate visitors about archeological resources, efforts to allocate existing law enforcement resources towards resource protection, and inventories to locate and protect archeological sites. Added to this, other actions in and outside of the park could result in a beneficial impact. Most impacts to archeological resources outside of the South Unit would generally be addressed and mitigated through actions such as law enforcement, inventory of planned projects, and collection for study and preservation.

The effects on archeological resources under alternative C are anticipated to be beneficial. Illegal collecting should decrease due to increased law enforcement and increased inventory. Losses of archeological materials should be reduced considerably, and increasingly limited to losses through natural processes. Park staff would continue to protect, interpret, and provide opportunities for scientific research on archeological resources. For the purposes of Section 106, the determination of effect would be *no adverse effect*.

There would be no impairment of archeological resources from implementation of alternative C.

Museum Collections

Analysis. Under alternative C, no active paleontological quarry would be opened. Park personnel would collect fossils deemed to be at risk of theft or erosion and where feasible, fossils would be cast for exhibit. These specimens would be housed in offsite repositories until the LHEC is operational. In addition, surveys and inventories of archeological resources would be developed and findings documented and the artifacts stored either at Midwest Archeological Center or the LHEC.

The current configuration for storage at the LHEC facility is currently unknown, but for this study, it was assumed LHEC would be able to house all specimens from the South Unit through the life of this management plan. It is intended that the off-site storage of collections would eventually come to an end. The collection would be subject to a minor adverse impact because the collection would continue to be split between facilities for some time before the LHEC would become available.

Under this alternative, it is the intention of the OST to gain control of all specimens that have been taken from the South Unit, as practical. If the Tribe is successful in that effort, it is unlikely to be adequate storage space for all the collection to be housed in any single facility. The collection would again be subject to a minor adverse impact because the collection would continue to be split between facilities.

Finally, the movement of fragile materials between facilities may cause the loss of materials. The impact would be a minor adverse.

Cumulative Effects. Numerous museums and private parties holding archeological and fossil collections from the badlands of South Dakota exist throughout the world as a result of excavations by government agencies, universities, historical societies, and individuals over the last approximately 150 years. Known collections at the facilities in South Dakota are extensive. The collections within the park make up a small but important portion of the whole collection. The collections would be expanded through donation, testing prior to development, excavations of sites inadvertently identified during construction work, or monitoring resource conditions in the field. Other activities identified as occurring within and external to the South Unit are unlikely to add a large amount of museum specimens to the collections. Cumulative impacts are expected to be minor and adverse.

Conclusion. Items in the collections would continue to be stored and maintained, with some facilities meeting NPS museum storage standards. It is assumed for this study that the LHEC would be able to house known collections from the South Unit. There would be a long-

term minor adverse impact on the overall preservation and usefulness of the collections. Accessibility to the collection by researchers and the public would be increased. Because there would be no major adverse effects on this resource, there would be no impairment or unacceptable impacts.

Ethnographic Resources

Analysis. Park managers would consult with the OST to develop and accomplish programs in a way that respects the beliefs, traditions, and other cultural values of the Tribe that has ancestral ties to South Unit lands. NPS staff would maintain a government-to-government relationship with the Tribe to ensure a collaborative working relationship, and would consult regularly with them before taking actions that would affect natural and cultural resources that are of interest and concern to them. Access to, and use of, American Indian sacred sites by American Indian religious practitioners would be accommodated in a manner that is consistent with applicable law, regulations, executive orders, and policy.

Ethnographic resources, including sacred sites and traditional cultural properties, would be identified and protected from impacts associated with the implementation of this alternative through increased consultation and inventory. As a result, there would be no effects on ethnographic resources from this alternative. Alternative C would not result in any change in access by American Indians or use of ethnographic resources sacred to the tribes. The alternative would not change the agreement that guarantees tribal members unrestricted access in perpetuity and requires their written consent to affect those sites. Consultation with tribes to identify traditional use areas would precede ground-disturbing or other activities that could affect the current use, viewshed, or perception of the resource.

Cumulative Effects. Actions inside the South Unit could affect ethnographic resources, including traditional cultural properties. Efforts to clean up the Bombing Range could alter vegetation patterns and landscapes, affecting the viewshed of a sacred site. Although surveys and

cleanup plans would help to reduce the extent of these effects, the cleanup efforts could result in long-term moderate, and possibly major adverse impacts.

Past, present, and anticipated projects that would contribute to impacts on ethnographic resources include (1) the cleanup of the former Bombing Range; (2) resource management under the North Unit GMP/EIS; (3) the Mni Wiconi water project; (4) the proposed DM&E rail line; and (5) the proposed Crazy Horse Scenic Byway. These combined actions would likely have beneficial impacts on ethnographic resources because they would provide for appropriate inventory, protection, and preservation of ethnographic resources through tribal consultation.

The impacts of other past, present, and anticipated projects, when considered with the impacts of alternative C, would result in beneficial impacts to ethnographic resources.

Conclusion. Alternative C would have the potential to result in beneficial effects on ethnographic resources due to increased inventory and protection, and the addition of appropriate interpretation. Added to this, other actions in and outside of the park could result in a beneficial impact; and the DM&E project's potential long-term moderate to major adverse effects. Most impacts to ethnographic resources outside of the South Unit would be addressed and mitigated through actions such as inventory of planned projects, tribal consultation, documentation and preservation.

For the purposes of Section 106, implementing alternative C would result in *no adverse effect* on ethnographic resources in the South Unit. Until the completion of inventories of ethnographic resources, park managers would conduct site-specific surveys and consult as appropriate with American Indians for each development action. Because there would be beneficial impacts, the park's resources and values would not be impaired.

SCENIC RESOURCES

Analysis. Under alternative C, additional facilities would be added to the park such as

improved roadways, new visitor contact and entrance structures, new small parking areas with short access roads, developed campgrounds with amenities such as restrooms, overlooks, and interpretive signing. These facilities would increase human use in the developed areas and along roadways. These facilities and use however would be dispersed throughout the South Park. As under the No-Action Alternative any expanded residential ranching structures would be visible in the vast open areas of the South Unit in the future. Expanding developments and activities related to ranching could generate more dust. Overall such development and activities would intrude upon the area's scenery affecting visibility, and introducing new light sources into the night sky. Such developments and land uses would be relatively small in scale and would have negligible to minor, long-term, localized, adverse impacts on scenery.

With the addition of trailheads more people would be dispersed throughout the park along trail for hikers and horseback use. These types of use can cause soil erosion and airborne dust particles that tend to linger in the air for short periods, affecting visibility. Overall, limited and highly dispersed new facilities and activities in areas of development would have short-term and long-term, localized, negligible to minor impacts on scenery and visibility.

New sources of outdoor light associated with new structures such as campgrounds, visitor contact stations and entrance stations and expanding visitor center would be introduced. These sources of light would be minimal. Public activities would generally be scheduled for daylight hours, and any new lighting needs would be minimized. Impacts on night sky from the implementation of alternative C would be negligible to minor, long term, and adverse.

Cumulative Impacts. Rehabilitation of the main park roads and parking areas and the addition of the facilities would increase the capacity of the park by an estimated 15 to 20 percent. This would result in a negligible, long-term, localized, adverse impact on the scenic resources of the park. Community and commercial scale renewable energy

development on the Pine Ridge Indian Reservation could have major adverse impacts on the scenic resources of the South Unit, permanently altering the panoramic vistas with the construction of wind turbines and/or solar panels on sites adjacent to the South Unit.

Overall, the development proposed under this alternative would intrude upon the area's natural scenery, affect visibility, and introduce new light sources into the night sky. Combined with other past, present, and reasonably foreseeable future impacts, impacts generated as a result of implementing alternative C would be long term, minor to major, and adverse.

Conclusion. Alternative C would have negligible to major, short-and long-term, localized, adverse impacts on scenery, visibility, and night sky. There would be no impairment of scenic resources and visual quality from this alternative.

VISITOR EXPERIENCE

Access

Analysis. Under alternative C, recreational opportunities would be available through guided trail rides, and hiking trails and camping sites would be established along the perimeter of the South Unit. Hiking would be allowed on some primitive trails in the Natural Area / Recreation Zone, with limited access to the Palmer Creek Unit. Visitors could plan and schedule guided backcountry camping trips at a backcountry contact station/visitor center. Guided horse camping trips would be offered.

Developed perimeter access would be focused in one location with trails, trailheads, parking areas, rest areas with comfort stations, overlooks, and wayside exhibits. Visitors could explore the South Unit at dispersed visitor access points along the perimeter. There would not be any improved roads providing access to the interior.

Park management would institute a reservation trail system for unguided access into the interior. Guided trail tours would take visitors to select areas in the interior. Biking along the roads

would be encouraged in places where bike lanes could be established.

Access would be afforded through the means identified above, thus restricting unguided access to ceremonial and other cultural sites of the South Unit. Preservation Zones would be established for limited access through guided tours only.

Cumulative Effects. Traffic projections indicate that a substantial increase in park visitation could result from the completion of the Heartland Expressway and the proposed Crazy Horse Scenic Byway. The increase from these roads originating from the south and west, added to visitation projections, could alter the current visitation patterns to the park. The routes for these two road projects already exist, but typically park visitors do not use them. Visitors' access to the park's South Unit would be improved by the upgrading of the roads and by their being emphasized with designations.

Conclusion. By improving access in the South Unit, alternative C would produce a beneficial effect on visitor access. The improvement in access would come from improvement of the local roads, guided tours into the backcountry, construction of new parking lots, increased camping opportunities, the development of interior pedestrian trails, and improved signage on surrounding roads. Access into the backcountry would be limited.

Availability of Information

Analysis. Under alternative C, park managers would continue to design exhibits with OST input. However, under alternative C, interpretive opportunities would be offered to visitors in a variety of new ways:

- A better understanding of Lakota culture would be promoted through a variety of education and interpretive offerings, such as living history and opportunities to meet with, listen to, and talk with Tribal elders, spiritual leaders, and native interpreters. The White River Visitor Center would add biological and ecological interpretation to exhibits about Oglala history and culture.

Multiple vista points around the perimeter would include wayside exhibits on the cultural importance of ethnographic resources.

- Emphasis would be placed on the preservation of Lakota language and culture through a variety of education and interpretation programs, such as family history and living history, monuments that memorialize events in Lakota history, and wayside exhibits that focus on native background and history. There would be a focus on elders and spiritual leaders. The Lakota language and Oglala culture would be incorporated into programs, interpretive displays, and wayside exhibits. Bilingual (English and Lakota) signs would be used on roads, in interpretive displays, and elsewhere.
- Historic and cultural discovery would occur at activities such as powwows and ceremonies. At some cultural or ceremonial sites, as well as at campgrounds, interpretive activities would be presented so visitors could learn more about the Lakota culture and history. Programs would feature tribal members who wear and explain traditional dress, and story-telling and oral history would be presented by Tribal elders.
- Interpretation of the Bombing Range would continue.
- Interpretive signs would be placed along roads to identify locations, animals and plants, historic locations, and mileages.
- The exhibits at the White River Visitor Center would be improved and expanded, and there would be a working museum with hands on education section and an entrance station would be developed in the vicinity of the White River Visitor Center. A visitor contact station would also be developed on the west side of the South Unit. Interpretation and orientation

information would also be available at the LHEC.

As a result of the expanded interpretive opportunities under alternative C, beneficial impacts on the availability of information about park resources would occur.

Cumulative Effects. The development of the proposed interpretive trails under the Nebraska National Forest Land and Resource Management Plan could also provide additional opportunities to disseminate information to visitors. These projects would produce beneficial effects on the availability of information for visitors.

Conclusion. Alternative C would result in beneficial effects on the availability of information about the park. The increase in the number of outlets where visitors could obtain information and the dispersed locations of these outlets would substantially improve the visitor experience.

Range and Enjoyment of Visitor Activity

Analysis. Vehicle use, hiking and pack stock use, camping, and picnicking are the four most popular activities.

Vehicle Use. Under alternative C, developed perimeter access would be focused in one location with trails, trailheads, parking areas, rest areas with comfort stations, overlooks, and wayside exhibits. Visitors could explore the South Unit at dispersed visitor access points along the perimeter. There would not be any improved roads providing access to the interior. Therefore, long-term minor beneficial impacts would occur from providing improved access on the perimeter of the park, while eliminating vehicles from much of the rest of the South Unit.

Hiking and Pack Stock. Under alternative C, hiking and pack stock opportunities would be available through guided trail rides, and hiking trails and camping sites would be established along the perimeter of the South Unit. Hiking would be allowed on some primitive trails in the Natural Area/Recreation Zone, with limited access to the Palmer Creek Unit. Park management would institute a reservation trail system for unguided access into the interior.

Guided trails tours would take visitors to select areas in the interior. Thus, long-term negligible beneficial impacts to hiking and pack stock use would occur as a result of developing a small amount of additional hiking trails and pack stock opportunities under alternative C.

Camping. Primitive camping would be allowed by permit in designated areas along the perimeter and in the Natural Area/Recreation Zone. Visitors could plan and schedule guided backcountry camping trips at a backcountry contact station/visitor center. Guided horse camping trips would also be offered. Developed camping would not be provided in the Development Zone. Therefore, long-term negligible beneficial impacts to camping would occur from established camping on the perimeter of the South Unit, while also eliminating camping from much of the rest of the South Unit.

Picnicking. There would be expanded opportunities to picnic, such as along the perimeter of the South Unit, but picnicking would be limited to much of the rest of the South Unit.

Cumulative Effects. It is projected that various plans for road improvements in the region would increase opportunities for driving and sightseeing. If the proposed Crazy Horse Scenic Byway were designated and marked by signs, it would offer an additional scenic driving opportunity in the region. The management plan for Buffalo Gap National Grassland calls for the development of a primitive campground near the South Unit, expanding the region's camping opportunities (USFS 2001). These projects would result in beneficial impacts for visitors seeking recreational opportunities in the region.

Conclusion. There would be slightly more opportunities throughout the park for visitors seeking to drive/sightsee, hike, camp, and/or picnic, creating beneficial effects on such visitors.

SOCIOECONOMICS

Analysis. Implementation of alternative C would be expected to lead to an increase in expenditures on staff and operations over the

No-Action Alternative. The total number of staff needed under this alternative would be expected to increase to 21 full-time positions at a cost of \$2.5 million per year. In addition, implementation of this alternative would be expected to generate additional expenditures for the construction or rehabilitation of facilities (\$11.2 million) and development of a number of studies and plans (\$4.7 million), all of which are considered one-time costs. On-going operations would bring well paying, permanent employment opportunities to a traditional, economically depressed area which could have noticeable economic benefits. In addition, one-time construction and plan and study costs could also generate minor to moderate economic impacts throughout the larger study region, though these impacts are expected to be short-term. This infusion of federal agency spending into the economy is likely to generate additional economic activity in terms of jobs and income. The intensity of these impacts would depend on the ability of local firms to have the necessary skills and expertise to meet the requirements of the construction and study projects.

Visitation under alternative C would be expected to increase over the long-term compared to that which would exist under the No-Action Alternative. However, visitation under this alternative would not increase as much as other action alternatives due to the emphasis on preservation, restoration of natural and cultural resources. Increases in visitation would likely result in increased visitor spending in the local and regional economy due to more visitors spending money while visiting the area or extending their time in southwestern South Dakota, though it is expected the impact would be small. In addition, increased sustained visitation to the South Unit under this alternative would not be sufficient to generate additional economic development outside park boundaries that would generate additional economic benefits to a traditionally economically depressed region.

Implementation of alternative C could also cause adverse economic impacts as grazing leases are eliminated over time at the South Unit.

Cumulative Impacts. Past, present, and anticipated projects that would contribute to impacts on socioeconomics include (1) the cleanup of the former Bombing Range; (2) resource management under the North Unit GMP/EIS; and (3) approval of the proposed Crazy Horse Scenic Byway. These combined actions would likely have short- and long-term beneficial impacts on socioeconomics due to increased access and exposure to the opportunities at the South Unit, potentially generating additional visitation to the South Unit which could generate additional economic benefits through increased visitor spending. The impacts of other past, present, and anticipated projects, when considered with the impacts of alternative C, would result in beneficial impacts on socioeconomics.

Conclusion. The socioeconomic effect of operations and visitor use at the South Unit under the alternative C would be expected to have beneficial economic impacts.

PARK OPERATIONS

Analysis. Staffing levels would increase to approximately 21 full-time positions to implement the actions of alternative C. Under this alternative it is estimated that the park would need an annual operating budget increase of approximately \$2.5 million to operate the South Unit once the alternative is fully implemented. This would result expanding a wide range of recreation opportunities, improving interpretation and education, improving resource protection, law enforcement, and administration. This would also lead to better services and programs, such as developing an education and outreach program. Expanded staff levels would be ready to face future changes. Knowing the value of promoting volunteers in the park in view of continual shrinking budgets, major emphasis would also be placed on interagency volunteer coordination, which would efficiently leverage partnerships and volunteers to achieve the purposes of the park. Programs to involve volunteers in inventory, monitoring, interpretation and outreach, cultural resource data collection, resource restoration, area or campground

hosting, trail patrol, light maintenance, and other aspects of park operations would be continued and expanded. The effects on the South Unit would be major, beneficial, and long term.

Cumulative Impacts. There would continue to be a strong demand for the recreational opportunities that the South Unit would offer as well as those associated with nonprofit organizations and volunteers to be partners in managing park lands. The region and the country at large has a strong and growing population of highly skilled, senior population with outside sources of income, who tend to volunteer and would likely be able to supply adequate volunteer services. Even with increasing demands, better organization and use of volunteers would keep supply abreast with demand and benefit park operations.

Conclusion. A clear plan of action and increased staff to implement those actions would result in highly effective park operations and coordination of partners and volunteers to protect resources and visitors. The effect would be beneficial.

UNAVOIDABLE ADVERSE IMPACTS

Under alternative C, the activities related to the construction of additional facilities, as well as human use, would result in minor adverse impacts on natural resources in some areas of the South Unit. Although these impacts (e.g., soil compaction, vegetation trampling, wildlife disturbances, and decreased opportunities for solitude) would be unavoidable, mitigation to reduce them would be carried out where possible. The impacts on wildlife, vegetation, and the visitor experience are discussed in detail for the specific impact topics.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Under alternative C, there would be a commitment of land, raw materials and

consumption of fuels associated with the construction of the new visitor and administrative facilities as described in detail in —Chapter 3: Alternatives, Including the Preferred Alternative.” These energy requirements, raw materials and land requirements to construct new facilities represent an irretrievable commitment of resources for a period of time.

RELATIONSHIP OF SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

The majority of the South Unit would be managed as a Preservation Zone (approximately 77 percent), allowing the park to maintain its long-term productivity. Only a small percentage of the South Unit would be converted to Development Zone (approximately 2 percent). A Natural Area/Recreation Zone (approximately 21 percent) would exist along the perimeter.

Under alternative C, new highly developed visitor use and administrative facilities would be constructed in the Development Zone as well as more primitive facilities for the same purpose within the Natural Area/Recreation Zone. There would be some localized loss of ecological productivity as a result. The proposed developments within both zones could reduce ecological productivity in some localized areas as a result of construction and increased use. Actions would be taken to minimize adverse effects on the long-term productivity of biotic communities. Proposed actions would yield long-term benefits from a visitor experience perspective.

Short-term impacts might result from construction of new visitor and administrative facilities to resources such as local water pollution, as detailed in the analyses of specific impact topics. Noise and human activity from construction and restoration might displace some wildlife from the immediate area. However, these activities would not jeopardize the long-term productivity of the environment except in areas occupied by new facilities.

IMPACTS OF ALTERNATIVE D: PROTECT RESOURCES WHILE EXPANDING INTERPRETIVE OPPORTUNITIES (PREFERRED ALTERNATIVE)

NATURAL RESOURCES

Vegetation

Analysis. Vegetation would be lost or altered in local areas under alternative D, primarily from the development or improvement of facilities and visitor services. Most new developments or improvements would be placed within the existing footprint of disturbed areas in which the vegetation already has been altered; therefore, little additional loss of native vegetation would result from construction or improvement actions proposed under alternative D. Given the previous vegetation disturbance along existing perimeter roadways in most of these areas, and with the use of appropriate mitigation measures to minimize additional impacts (such as ensuring that equipment stays within project area boundaries, revegetating disturbed areas with native vegetation, avoiding known or possible locations for special-status plant species, and taking steps to avoid the spread of exotic species), there would be negligible to minor adverse effects on native vegetation from these actions.

The elimination of livestock grazing in Range Unit 505 would have an influence on the distribution of some plant species and plant associations resulting in short- to long-term beneficial and short- to long-term negligible adverse effects on vegetation. Moderate grazing reduces mean annual aboveground production of mixed grass prairie only a little but can result in a shift in the relative composition of cool and warm season grasses (Plumb and Dodd 1993). Livestock grazing in the South Unit influence not only the grassland composition but also exotic species distribution. Whereas some nonnative species may actually increase under grazing pressure (e.g., Canada thistle), yellow sweetclover appears to be controlled by grazing. For example, yellow sweetclover occurs in greater abundance on ungrazed lands of the

North Unit versus similar grazed lands in the South Unit. Conversely, blue grama/buffalo grass grasslands tend to be absent within the lightly grazed or ungrazed lands of the North Unit (Bureau of Reclamation 1999).

The elimination of livestock grazing and the introduction of bison to the South Unit would result in short- to long-term beneficial effects and short- to long-term negligible to minor adverse impacts to vegetation. The introduction of bison could create a shift in the composition and structure of native vegetation in South Unit. Cattle and bison are considered generalist foragers, yet differences in food habits indicate that cattle are more selective foragers than bison. Bison tend to avoid patches dominated by forbs and browse while cattle select more strongly for these forages. Forage selection by bison varies with changes in forage quality and abundance. Evidence suggests that bison graze heavily on a local scale, which when combined with secondary effects such as wallowing, trampling, and rubbing, create a vegetation mosaic resulting in long-term beneficial effects on vegetation. Foraging by cattle is highly associated with temporal and spatial patterns of higher forage quality and/or quantity. Bison also respond to spatial and temporal variation in forage quality by selecting for higher quality and thus influence function and structure (Anderson 2006). Additionally wallowing by bison directly impacts late-successional perennial vegetation and provides a refuge for flora different from that of the surrounding grassland. Bison also show greater affinity for rubbing, resulting in substantial physical damage to individual woody plants.

Constructing new parking lots and improving the existing road to the quarry west of Sheep Mountain Table would cause both direct and indirect adverse effects on prairie vegetation. Native grassland vegetation would be lost or damaged during siting, construction, improvement, and maintenance of the parking lots and roadway. Some rare plants could be

lost, although it might be possible to locate improvements to the road to avoid those plants. Some native plants would be permanently lost because of the parking lot or road footprint. Several indirect impacts also could result from the improvement of the road segment. If erosion along the road increased, more vegetation would be lost. Nonnative plants could be introduced or spread into disturbed areas. If visitors created additional —informal” pulloffs by parking off the side of the road, some roadside plants might be crushed, trampled, or picked. Even with mitigation measures, construction equipment in the project area would result in the damage or loss of other plants resulting in short- to long-term negligible to minor adverse impacts to vegetation.

Vegetation would be altered or lost through visitation under alternative D. As in the other alternatives, people walking over and trampling plants in and around new campgrounds, campsites, road overlooks, picnic areas, and trailheads would cause the loss of native vegetation. These actions would result in long-term minor to moderate adverse effects on vegetation.

As soils would be affected, building or designating new trails and routes would cause both beneficial and adverse effects for the park’s vegetation. Hiker and pack stock use would increase on new trails on the perimeter and the interior, resulting in the trampling and loss of vegetation. More erosion in any of these areas would cause the loss of some plants, and the potential for visitors or pack stock to inadvertently carry in and spread exotic species also would increase. Developing a trailhead in the South Unit could encourage more four-wheel-drive use of the unimproved roads in this area, which in turn could increase erosional impacts and native plant loss. If more pack stock used this area, there would be increased potential for the spread of exotic species. Depending on the level of use, time of use, and the vegetation, there could be a minor to moderate long-term adverse impact on vegetation in local areas.

Designating campsites along the primitive roads in the South Unit would increase use in these

areas, so that some native vegetation probably would be trampled or lost. However, the loss of vegetation from indiscriminate camping and from the creation of informal campsites would be reduced, a minor beneficial effect.

Development and routine maintenance of facilities, including installation and maintenance of roads, trails, and developed sites within the park would also disturb vegetation locally due to the presence of work crews and clearing of vegetation. These activities would have long-term localized negligible adverse impacts on vegetation.

Adding interpretive opportunities would benefit park vegetation by improving visitor education. With increased visitor appreciation of native and rare plants would be increased, so that adverse effects on vegetation would be reduced. One beneficial effect of such education would be to help avert the spread of exotic species from visitors walking in the park. The presence of the learning center and the research zone could help encourage research that would benefit the protection and management of the park’s vegetation. However, there also would be the potential for the trampling and loss of some rare plants along short interpretive trails.

Most native vegetation in Badlands National Park would continue to be protected and sustain itself under alternative D. The loss of native vegetation would be reduced by better protection, and native vegetation would benefit from designating campsites, trails, and routes, eliminating the use of recreational vehicles from some areas, and increasing education and interpretation. The short- to long-term beneficial and adverse effects on native vegetation from alternative D would be negligible to moderate.

Cumulative Effects. Other past, present, and anticipated future projects that would contribute both adverse and beneficial impacts on vegetation include: (1) the cleanup of the former Bombing Range; (2) resource management actions under the North Unit GMP/EIS; (3) management of motorized vehicle use under the Nebraska National Forest Travel Management Plan; (4) the Mni Wiconi water project; (5) the proposed DM&E rail line; (6) the proposed

Crazy Horse Scenic Byway and (7) potential wind power development projects.

Short-term to long term minor adverse impacts to vegetation would result from the loss or alteration of vegetation during construction activities in the South Unit, such as the Mni Wiconi water project, the proposed DM&E rail line, and the proposed Crazy Horse Scenic Byway. Work at the White River Visitor Center area and cleanup efforts at the Bombing Range may cause the loss of natural vegetation and have the potential to contribute to cumulative adverse impacts. Actions outside of the park, including the construction and operation of the DM&E rail line and the designation of the proposed Crazy Horse Scenic Byway, which could increase visitation to the park, and the construction of primitive campgrounds and trails in the national grassland adjacent to the park could alter or cause the loss of native plants. These other actions, added to the developments and improvements of alternative D and a likely increase in visitation would result in a long-term minor to moderate adverse cumulative effect on the region's native vegetation. Some vegetation would be cut and removed during construction and operation of the roadway and rail line, potentially increasing invasive plant species until mitigation measures are employed. This would result in short-term negligible adverse impacts to vegetation. In addition, park maintenance operations along existing roads would continue to affect plants growing on road shoulders. Grazing in the South Unit would continue, altering the types and distribution of vegetation and slowing the restoration of the natural grassland ecosystem. The construction of the Mni Wiconi water pipeline probably would cause negligible effects on vegetation because it would be built along roads where native vegetation already has been altered. The development of wind power projects outside of the park could result in localized long-term minor adverse impacts with the removal of vegetation.

In addition to cumulative actions that have negative effects on vegetation, there are also some actions that have beneficial effects. Long-term beneficial effects on the park's vegetation would result from continued NPS prescribed

burning efforts, the reintroduction of native vegetation, and weed management efforts. A beneficial long-term effect on range condition would result from increases in prescribed burning in the adjacent Buffalo Gap National Grassland by reducing fire hazard fuel accumulations and aiding in fire suppression activities by reducing fire intensity and severity protecting existing native vegetation, as is delineated in the Land and Resource Management Plan for the Nebraska National Forest and Associated Units (USFS 2001). The resource management actions under the North Unit GMP/EIS identify desired conditions including specific vegetation conditions for management areas, to help restore native plant communities. Additionally, the management of motorized vehicle use under the Nebraska National Forest Travel Management Plan could have long-term beneficial impacts to vegetation, due to improving resource protection practices. Those actions, when added to the effects of designating trails and routes and campsites in the park, eliminating recreational vehicle use in parts of the park, and increasing educational and interpretive efforts, changing the use of Sheep Mountain Table, and encouraging more research, would result in better protection of native vegetation and its possible increase in previously disturbed areas. All these actions would result in a long-term beneficial cumulative effect on the region's native vegetation.

Overall, when all the effects of actions in and outside of the park were added to the effects from alternative D, there would be long-term minor adverse cumulative effects impacts on vegetation. However, the actions of alternative D would add a minimal increment to this cumulative effect because the effects on vegetation resulting from alternative D would be localized and spread out over time.

Conclusion. Alternative D would have short- to long-term adverse and beneficial effects on vegetation resulting in negligible to moderate adverse effects on vegetation associated with the development or improvement facilities and visitor services. The impacts of other past, present, and anticipated projects combined with alternative D would likely result in long-term

minor adverse impacts to vegetation. However, the actions of alternative D would add a minimal increment to this cumulative impact. There would be no impairment of vegetation from implementation of alternative D.

Wildlife

Analysis. New developments, improved access, and increased visitation to parts of the park would be the primary actions affecting wildlife and their habitat under alternative D. Designation of a Natural Area/Recreation Zone approximately 90 percent of the South Unit would improve the protection of wildlife populations and habitats by eliminating recreational vehicle use in that area. This would remove a source of wildlife disturbance from vehicles being driven on or off two-track roads. This would result in a long-term beneficial effect on wildlife populations in local areas.

As under alternatives B and C, initiation of active restoration programs and integrated weed management strategies for disturbed areas would increase the amount of native habitat available to wildlife. These actions would result in localized long-term beneficial effects.

As under alternative C, reintroduction of bison into Range Unit 505 to create a preserve/reserve and the sustainable management of cattle grazing with potential long-term elimination in the South Unit would restore a more native grazing regime. Grazing dynamics between bison, cattle, other ungulates, and prairie dogs would be modified because bison and cattle have different grazing patterns (Plumb and Dodd 1993; Steuter and Hidinger 1999). The rate of expansion of prairie dog towns could be slowed by the elimination of cattle grazing over the long-term. Grazing provides open areas, which facilitates colonization by prairie dogs (Uresk et al. 1981; Vermeire et al. 2004). However, the reintroduction of bison would restore a native grazer to the South Unit resulting in long-term beneficial effects.

As under alternative B, opening a quarry for research purposes would be accompanied by improving the existing road to the quarry, construction a new road segment from the end of the existing quarry road to the quarry,

construction of a parking area, and a paved camping area. These developments would cause the permanent loss of grassland habitat or sparsely vegetated areas, displacing wildlife along this corridor. Prairie dog towns are located in the vicinity of these developments. Clearing vegetation in that area would result in the loss of wildlife forage and shelter. Noise from construction equipment and people would displace some wildlife and temporarily disturb prairie dogs. Most birds, mammals, and reptiles would avoid the area during the construction period, but many would return after construction ceased. Some animals, primarily invertebrates, would be unable to move out of the construction area and would be killed. The new developments along with the new road segment and improved road segment could have a long-term minor to moderate adverse effect on area wildlife.

Increased educational and interpretive efforts under alternative D would generally benefit wildlife. The addition of waysides, guided trail tours, interpretive trails, and two new visitor contact stations would help educate visitors, increasing their appreciation of wildlife in the South Unit and minimizing impacts they could cause such as by teaching them to avoid feeding wildlife. This would result in a long-term beneficial effect on wildlife in the South Unit.

Alternative D would include new developments to enhance visitor access and enjoyment of the South Unit. New developments along the perimeter would cause a permanent loss of some grassland habitat or sparsely vegetated areas. New developments within the interior of the park include the construction of a primitive 15-unit camping area with toilets, pedestrian trails, horseback trails, walk-in camping units, and a backcountry ranger station and equestrian facilities. These developments would also cause the permanent loss of grassland habitat or sparsely vegetated areas. These losses would primarily affect smaller, less mobile wildlife species and species with smaller home ranges, such as invertebrates. Some reptiles, small mammals, and birds also could be displaced. The loss of habitat would result in a long-term minor adverse effect on animals near these facilities. Increased noise and human activity due to construction of new developments could

temporarily displace some animals such as rodents and birds, resulting in minor short-term adverse impacts on wildlife populations in local areas.

Visitation to parts of the park probably would be increased by improved access from developing and improving roadways, wayside exhibits, camping areas, pedestrian trails, and horseback trails. In turn, habitat fragmentation would increase over current levels because of more visitor use of trails and routes. Some wildlife sensitive to the presence of people — pronghorn antelope, bighorn sheep, bobcat, badger, and raptors — might be displaced from areas around these corridors during the peak high use season. These actions would result in a minor to moderate short-term and long-term adverse impact on wildlife populations in local areas, depending on such factors as the level, duration, and type of visitor use, the season of use, and the wildlife species. Increased visitation due to new developments could indirectly affect some prairie dogs — some visitors might wander into prairie dog towns, affecting the behavior of animals in the area, but any disturbance would be temporary and the effect would be negligible to minor.

As with alternative B, the improved and expanded quarry road and additional new road segment along the perimeter may result in some wildlife being hit by vehicles and injured or killed, resulting in indirect adverse impacts. Maintenance activities along the roadways could disturb wildlife. The extent of the effects would depend partly on the location of the roads and their design. With careful siting of the roads and the use of mitigation measures, the improved road segments would result in a long-term minor to moderate adverse effect on area wildlife.

Some new facilities under alternative D, such as the designated campsites in the South Unit, probably would result in seasonal increases in wildlife populations that are attracted to people and their food, such as mice, chipmunks, and black-billed magpies. This action would result in a long-term beneficial effect on these populations in local areas.

Hunting could increase in the South Unit with improved access, resulting in more animals

being harvested, but with appropriate regulation and monitoring, the adverse effects on wildlife populations would be minor.

Cumulative Effects. Past, present, and anticipated projects that would contribute to impacts on wildlife include (1) resource management under the North Unit GMP/EIS; (2) resource management under the Buffalo Gap National Grassland Land and Resource Management Plan; (3) modifications to motorized travel under the Nebraska Travel Management Plan FEIS; (4) wilderness designation under the proposed *Tony Dean Cheyenne River Valley Conservation Act* of 2010; (5) Prairie Dog Management Plan activities and plague efforts; (6) training activities of the South Dakota National Guard; (7) construction activities associated with the Mni Wiconi water project; (8) the proposed DM&E rail line; and (9) the proposed Crazy Horse Scenic Byway. These actions would likely have short and long-term minor adverse impacts on wildlife due to land disturbance activities from construction projects and other human uses, resulting in some mortality to wildlife, increased fragmentation of wildlife habitats, increased potential for wildlife to be displaced and reduced number of areas where wildlife could exist without people or facilities. These actions would also have long-term beneficial impacts on wildlife from improved resource management, additional protections from designation of wilderness area, and decreased impacts from motorized vehicles. Management efforts to expand prairie dogs at Buffalo Gap National Grassland and plague dusting efforts in the North Unit would have beneficial effects on the species. When the beneficial and adverse impacts of other past, present, and anticipated projects, are considered with the impacts of alternative D, there would be long-term minor adverse impacts on wildlife.

Conclusion. Alternative D would have short and long-term minor to moderate adverse impacts to wildlife; as well as short and long-term beneficial effects. The impacts of other past, present, and anticipated projects combined with alternative D would likely result in long-term minor adverse impacts. There would be no

impairment of wildlife from implementation of alternative D.

PALEONTOLOGICAL RESOURCES

Analysis. Alternative D proposes the greatest percentage area managed as Natural Area and the smallest as Development Zone. Focusing on fossil resource protection, changes in proposed management would increase public education activities, reduce public vehicle access, and provide for increased law enforcement patrols. This alternative would provide for paleontological inventories for planned projects and the location, documentation, and preservation of important fossils in the South Unit. Databases would be prepared to aid in fossil management. A paleontological quarry would be developed for public education, paleontological research, and preservation. Livestock grazing would continue in the foreseeable future, but would gradually be eliminated from the South Unit. Interpretation of paleontological resources within the context of Lakota oral history could be developed through increased interpretive opportunities that focus on Lakota and OST Tribal beliefs. There would be a focus on elders and spiritual leaders and their oral history about fossil resources. Paleontologists could be hired to manage and implement these activities. In addition, unsupervised visitor activities would be restricted to the smallest area, reducing the potential for theft or inadvertent damage to, or theft of, fossils. The focus would be to restore natural species and processes when possible. Fossils removed from the South Unit, whether in the past or in the future, could be housed within the LHEC, for the benefit of the Tribe and for future secure storage and study. Tribal member guides would interpret paleontological resources in relationship to Lakota oral history for the public.

Therefore, the current long-term adverse impacts would be reduced in the foreseeable future under alternative D, and major beneficial impacts would occur based on increased paleontological inventory, collection, preservation, law enforcement presence, availability of appropriate personnel, and interpretation/public education.

Cumulative Effects. The primary projects and actions that could contribute to cumulative effects are summarized below.

Alternative D anticipates a museum and fossil curation facility at the LHEC. This would provide for the curation and preservation of fossils. These actions would likely be beneficial to paleontological resources in that they would increase paleontological education opportunities and contacts, provide for additional law enforcement, and provide for ongoing and long-term collection and preservation of important fossils.

The impacts of other past, present, and anticipated projects, when considered with the impacts of alternative D, would result in beneficial impacts to paleontological resources.

Conclusion. Alternative D would produce beneficial effects on paleontological resources. There would be an expected reduction in illegal removal of fossils from the South Unit by visitors and collectors, reduced livestock trampling of fossils, and continued weathering and mass wasting (landslides). These impacts could be mitigated by continuing efforts to educate visitors about fossils, efforts to allocate existing law enforcement resources towards fossil protection, inventories to locate and protect fossils, and availability of professional personnel. Added to this, other actions in and outside of the park could result in a long-term cumulative moderate beneficial impact. Most impacts to fossil resources outside of the South Unit are being addressed and mitigated through actions such as law enforcement, inventory of planned projects, and collection for study and preservation.

The effects on paleontological resources under alternative D are anticipated to have a major beneficial effect. Illegal fossil collecting should decrease from increased law enforcement, and increased inventory. Any loss of fossils, reduced from current levels, not destroy the integrity of the park relative to paleontological resources—fossils would continue to be present throughout the park, and the park staff would continue to protect, interpret, and provide opportunities for scientific research on paleontological resources. People still could come to the South Unit and

enjoy its values, including its fossils. The interpretive focus would be on the Lakota oral history view of these important resources.

There would be no impairment of paleontological resources from implementation of alternative D.

SOUNDSCAPES

Analysis. Impacts related to soundscapes under alternative D would primarily be a result of constructing campgrounds, visitor facilities, and access to paved and unpaved pedestrian and horseback trails. These construction activities would largely occur in the Natural Area/Recreation Zones of the South Unit. Impacts to soundscapes associated with these construction activities would be short-term, moderate to major, and adverse. Furthermore, construction activities within the proposed Development Zone of alternative D, located on the western and southern portion of the South Unit and includes the White River area, would include the construction of parking lots and visitor facilities, would also have short-term, moderate to major adverse impacts on soundscapes within the South Unit.

Noise levels would be likely to increase under alternative D in several places that have been relatively quiet in the past. More visitors and vehicles would be likely at the White River Visitor Center, the proposed camping areas, pedestrian trails, horseback trails, parking areas, and at the quarry, as a result of improving the existing road leading to the quarry west of Sheep Mountain Table. As a result, actions proposed under alternative D would have short-term, moderate to major adverse impacts on soundscapes within the South Unit.

Cumulative Effects. As with the No-Action Alternative, short-term minor to moderate adverse effects from noise would be caused by park construction machinery within the South Unit, including construction of the LHEC. Cleanup operations of the former Bombing Range would also likely cause short-term minor to moderate adverse effects on soundscapes within the South Unit. Outside the South Unit, the construction of the Mni Wiconi water project

would generate noise that would be audible in places in the South Unit. Traffic along BIA Routes 27 and 2, and BIA 41, as well as traffic leading to the solid waste management facility at Red Shirt would continue to generate noise intrusions in the South Unit, resulting in long-term, negligible to minor adverse impacts on soundscapes within the South Unit. The potential extension of the DM&E railroad and the construction of the proposed Crazy Horse Scenic Byway could also have short-term negligible to minor adverse impacts on soundscapes within the South Unit. These effects, added to noise caused by visitors and park operations under alternative D, would result in short and long-term minor to moderate cumulative adverse noise effects in local areas. When these noises are combined with the sounds of visitor and administrative use in the South Unit, there could be negligible to minor, long term, adverse cumulative impacts on soundscapes.

Conclusion. Due to construction activities proposed under alternative D, the soundscapes within the South Unit would likely change substantially in the short-term. However, in areas not identified as areas for future construction, there would continue to be long-term negligible to minor adverse effects on the park's soundscape in local areas, largely from visitation and administrative activities in developed areas. Noise from activities under alternative D added to noise from other actions within and outside the South Unit could result in short-and long-term, moderate to major adverse cumulative effects in local areas. These effects would not be sufficient to constitute an impairment of park resources or values.

CULTURAL RESOURCES

Archeological Sites

Analysis. Under alternative D, there would be the highest percentage of area managed as Natural Area/Recreation Zone and a small area as Development Zone. Focusing on resource protection, changes in proposed management would increase public education activities, reduce public vehicle access, and provide for

increased law enforcement patrols. Alternative D would provide for archeological inventories for planned projects and to locate, document and preserve significant archeological resources in the South Unit. Databases would be prepared to aid in resource management. An archeological resources management plan and a curatorial management plan would be completed. Under alternative D, facilities would be conducted along the perimeter and a road to the paleontological quarry site. Livestock grazing would continue in the foreseeable future but would be reduced when possible. Activities associated with the restoration of the rangeland would likely be beneficial because restoration focuses on restoring vegetation and reducing erosion. However, increased visitation by hikers could increase erosion in some areas of the South Unit. Interpretation of archeological resources within the context of Lakota oral history could be developed through increased interpretive opportunities that focus on Lakota and OST Tribal beliefs. There would be a focus on elders and spiritual leaders and their oral history about archeological resources. In addition, unsupervised visitor activities would be restricted, reducing the potential for theft or inadvertent damage to, or theft of, archeological materials. There are plans to build a LHEC and to upgrade the White River Visitor Center to provide for curation and preservation of artifacts. These actions would likely be beneficial to archeological resources in that they would increase archeological education opportunities and contacts, provide for additional law enforcement, and provide for ongoing and long term collection and preservation of important archeological sites.

The focus would be to restore natural species and processes when possible. Artifacts removed from the South Unit, whether in the past or in the future, would be able to be housed within the park, for the benefit of the Tribe and for future secure storage and study. Tribal member guides would interpret archeological resources in relation to Lakota oral history for the public.

Therefore, the current long term adverse impacts would be reduced in the foreseeable future under alternative D, and beneficial impacts would occur based on increased archeological

inventory, collection, preservation, law enforcement presence, availability of appropriate personnel, and interpretation/public education.

Cumulative Effects. Past, present, and anticipated projects that would contribute to impacts on archeological resources include (1) the cleanup of the former Bombing Range; (2) resource management under the North Unit GMP/EIS; (3) actions on the Buffalo Gap National Grassland; (4) the Mni Wiconi water project; (5) the proposed DM&E rail line; and (6) the proposed Crazy Horse Scenic Byway. These combined actions would likely have beneficial impacts on archeological resources because they would provide for appropriate inventory, protection, and preservation of important fossil resources.

The impacts of other past, present, and anticipated projects, when considered with the impacts of alternative D, would result in beneficial impacts to archeological resources. All proposed construction projects should include archeological resources inventories and implemented measures to protect them. If so, these projects should have a beneficial impact on archeological resources as additional surveying would occur.

Conclusion. Alternative D would have the potential to result in beneficial effects on archeological resources. There would be an expected reduction in illegal removal of archeological resources from the South Unit by visitors and collectors and reduced livestock trampling. The increased knowledge about the resource base would improve the ability of the park to manage the resources, as well as improve project planning and decision making. Impacts resulting from continued weathering and mass wasting could be mitigated by continuing efforts to educate visitors, efforts to allocate existing law enforcement resources toward protection, and inventories to locate and protect archeological sites. Added to this, other actions in and outside of the park could result in a beneficial impact. Most impacts to archeological resources outside of the South Unit are being addressed and mitigated through actions such as law enforcement, inventory of planned projects, and collection for study and preservation.

The effects on archeological resources under alternative D are anticipated to have a beneficial effect. Illegal collecting should decrease from increased law enforcement, and increased inventory. Losses of archeological materials should be reduced considerably, and increasingly limited to losses through natural processes only. Park staff would continue to protect, interpret, and provide opportunities for scientific research on archeological resources. People still could come to the South Unit and enjoy its values, including its archeology. The interpretive focus would be on the Lakota oral history view of these important resources.

For the purposes of Section 106, there would be no adverse effects. There would be no impairment of archeological resources from implementation of alternative D.

Museum Collections

Analysis. Under alternative D, an active paleontological quarry would be opened. All fossils collected from quarry operations and associated surveys would be prepared and curated by trained park personnel and stored in an offsite museum until the LHEC museum is fully operational. Park personnel would collect fossils deemed to be at risk of theft or erosion and where feasible, fossils would be cast for exhibit. These specimens would also be housed in offsite repositories until the LHEC is operational. In addition, surveys and inventories of archeological resources would be developed and findings documented and the artifacts stored either at Midwest Archeological Center or the LHEC.

It is anticipated that the excavations from an active paleontological quarry would produce a large amount of specimens needing storage. The offsite facilities would be able to accommodate such a large amount of museum specimens. The current configuration for storage at the LHEC facility is currently unknown, but for this study, it was assumed the LHEC would be able to house all specimens from the South Unit through the life of this management plan. It is intended that the offsite storage of collections would eventually come to an end. The collection would be subject to a minor adverse impact because the

collection would continue to be split between facilities for some time before the LHEC would become available.

Under this alternative, it is the intention of the OST to gain control of all specimens that have been taken from the South Unit, as practical. If the Tribe is successful in that effort, it is unlikely to be adequate storage space for all the collection to be housed in any single facility. The collection would again be subject to a minor adverse impact because the collection would continue to be split between facilities.

Finally, the movement of fragile materials between facilities may cause the loss of materials. The impact would be a minor adverse.

Cumulative Effects. Numerous museums and private parties holding archeological and fossil collections from the badlands of South Dakota exist throughout the world as a result of excavations by government agencies, universities, historical societies, and individuals over the last approximately 150 years. Known collections at the facilities in South Dakota are extensive. The collections within the park make up a small but important portion of the whole collection. The collections would be expanded through donation, testing prior to development, excavations of sites inadvertently identified during construction work, or monitoring resource conditions in the field. In addition, active efforts would be taken to retrieve parts of the collection scattered in other museums or private collections. Other activities identified as occurring within and external to the South Unit are unlikely to add a large amount of museum specimens to the collections. Cumulative impacts are expected to be minor and adverse.

Conclusion. Items in the collections would continue to be stored and maintained, with some facilities meeting NPS museum storage standards. It is assumed for this study that the LHEC would be able to house known collections from the South Unit, but the volume of materials coming from private and other repositories may overcome storage facilities. There would be a long-term minor adverse impact on the overall preservation and usefulness of the collections. Accessibility to the collection by researchers and the public would be increased. Because there

would be no major adverse effects on this resource, there would be no impairment or unacceptable impacts.

Ethnographic Resources

Analysis. Park managers would consult with the OST to develop and accomplish programs in a way that respects the beliefs, traditions, and other cultural values of the Tribe that has ancestral ties to South Unit lands. Park managers would maintain a government-to-government relationship with the Tribe to ensure a collaborative working relationship, and would consult regularly with them before taking actions that would affect natural and cultural resources that are of interest and concern to them. Access to, and use of, American Indian sacred sites by American Indian religious practitioners would be accommodated in a manner that is consistent with applicable law, regulations, executive orders, and policy.

Ethnographic resources, including sacred sites and traditional cultural properties, would be identified and protected from impacts associated with the implementation of this alternative through increased consultation and inventory. As a result, there would be no effects on ethnographic resources from this alternative. Alternative D would not result in any change in access by American Indians or use of ethnographic resources sacred to the tribes. The alternative would not change the agreement that guarantees tribal members unrestricted access in perpetuity and requires their written consent to affect those sites. Consultation with tribes to identify traditional use areas would precede ground-disturbing or other activities that could affect the current use, viewshed, or perception of the resource.

Cleanup of the Bombing Range within the South Unit and removal of munitions could allow safer tribal member access to important areas, and provide a beneficial impact. Potential visual impacts of munitions removal is generally short term and very limited in scope. However certain removal methods in “high density” debris areas can result in complete removal and replacement of up to several feet of surface and subsurface soils over large areas by remote controlled heavy

equipment. If such removal is necessary within the viewshed of an ethnographic resource or traditional cultural property within the South Unit, moderate adverse visual effects could result. Such cleanup activities could only occur after consultation with an authorization by the OST (Rom 2010) and every effort would likely be made to reduce any adverse impacts to the minimum needed for successful cleanup.

Cumulative Effects. Actions inside the South Unit could affect ethnographic resources, including traditional cultural properties. Efforts to clean up the Bombing Range could alter vegetation patterns and landscapes, affecting the viewshed of a sacred site. Although surveys and cleanup plans would help to reduce the extent of these effects, the cleanup efforts could result in long-term moderate, and possibly major adverse impacts.

Past, present, and anticipated projects that would contribute to impacts on ethnographic resources include (1) the cleanup of the former Bombing Range; (2) resource management under the North Unit GMP/EIS; (3) the Mni Wiconi water project; (4) the proposed DM&E rail line; and (5) the proposed Crazy Horse Scenic Byway. These combined actions would likely have beneficial impacts on ethnographic resources because they would provide for appropriate inventory, protection, and preservation of ethnographic resources through tribal consultation.

The impacts of other past, present, and anticipated projects, when considered with the impacts of alternative D, would result in beneficial impacts to ethnographic resources.

For the cleanup of the Bombing Range, removal of munitions could allow safer tribal member access to important areas, and provide a beneficial impact. Potential visual impacts of munitions removal are generally short term and very limited in scope. However some removal methods in “high density” debris areas can result in complete removal and replacement of up to several feet of surface and subsurface soils by remote controlled heavy equipment. If such removal is necessary within the viewshed of an ethnographic resource or traditional cultural property moderate adverse visual effects could

result. Such cleanup activities could only occur after consultation with an authorization by the OST (Rom 2010).

The Mni Wiconi water project would be expected to conduct ethnographic resource inventories and consultation to provide appropriate identification and protection. It could have a beneficial impact, and is not expected to result in any adverse effects.

The DM&E railroad project, if constructed, would likely have a moderate to major adverse impact on ethnographic resources (Grassrope, pers. comm.; Whiting pers. comm.). However, consultation and inventories were carried out and appropriate protection measures are may be implemented when possible. In most cases, if ethnographic resources are within or adjacent the DM&E project corridor the corridor cannot be easily modified to protect them. Therefore, major long term adverse effects are possible if this project were to be built.

The OSPRA is pursuing Federal Highway Administration approval for the proposed 215-mile Crazy Horse Scenic Byway (Lakota Country Times, October 13, 2009 Article by Tom Katus). The byway is likely to increase visitation within the South Unit, but without additional developed facilities negligible impact to ethnographic resources is expected, and interpretive aspects can result in beneficial impacts.

Conclusion. Alternative D would have the potential to result in beneficial effects on ethnographic resources due to increased inventory and protection, and the addition of appropriate interpretation. Added to this, other actions in and outside of the park could result in a beneficial impact; and the DM&E project's potential long term moderate to major adverse effects. Most impacts to ethnographic resources outside of the South Unit are being addressed and mitigated through actions such as inventory of planned projects, tribal consultation, documentation and preservation.

Implementing alternative D would result in a finding of *no adverse effect* on ethnographic resources in the South Unit under Section 106. Until the completion of inventories of

ethnographic resources, park managers would conduct site-specific surveys and consult as appropriate with American Indians for each development action. Because there would be no adverse impacts, the park's resources and values would not be impaired.

SCENIC RESOURCES

Under alternative D, additional facilities would be added to the park such as improved roadways, new visitor contact and entrance structures, new small parking areas with short access roads, developed campgrounds with amenities such as restrooms, overlooks, and interpretive signing. These facilities would increase human use in the developed areas and along roadways. These facilities and use however would be dispersed throughout the South Unit. As under the No-Action Alternative any expanded residential or ranching structures would be visible in the vast open areas of the South Unit in the future. Expanding developments and activities related to ranching could generate more dust. Overall such development and activities would intrude upon the area's scenery affecting visibility, and introducing new light sources into the night sky. Such developments and land uses would be relatively small in scale and would have negligible to minor, long-term, localized, adverse impacts on scenery.

With the addition of trailheads more people would be dispersed throughout the park along trail for hikers and horseback use. These types of use can cause soil erosion and airborne dust particles that tend to linger in the air for short periods, affecting visibility. Overall, limited and highly dispersed new facilities and activities in areas of development would have short-term and long-term, localized, negligible to minor impacts on scenery and visibility.

New sources of outdoor light associated with new structures such as campgrounds, visitor contact stations and entrance stations and expanding visitor center would be introduced. These sources of light would be minimal. Public activities would generally be scheduled for daylight hours, and any new lighting needs would be minimized. Impacts on night sky from

the implementation of alternative D would be negligible to minor, long term, and adverse.

Cumulative Impacts Rehabilitation of the main park roads and parking areas and the addition of the facilities would increase the capacity of the park by an estimated 15 to 20 percent. This would result in a negligible, long-term, localized, adverse impact on the scenic resources of the park. Overall, the development proposed under this alternative would intrude upon the area's natural scenery, affect visibility, and introduce new light sources into the night sky. Community and commercial-scale renewable energy development on the Pine Ridge Indian Reservation could have major adverse impacts on the scenic resources of the South Unit, permanently altering the panoramic vistas with the construction of wind turbines and/or solar panels on sites adjacent to the South Unit.

Combined with other past, present, and reasonably foreseeable future impacts, impacts generated as a result of implementing alternative D would be long term, minor to major, and adverse.

Conclusion. Alternative D would have negligible to major, short-and long-term, localized, adverse impacts on scenery, visibility, and night sky. There would be no impairment of scenic resources and visual quality from this alternative.

VISITOR EXPERIENCE

Access

Analysis. Under alternative D, most of the interior of the South Unit would be closed to public access. Recreational opportunities would be available through guided hikes, and unpaved hiking trails and camping sites would be established along the perimeter of the South Unit. Hiking would be allowed on some primitive trails in the Natural Area/Recreation Zone, with limited access to the Palmer Creek Unit. Park management would institute a permit trail system for unguided access into the interior; guided access would be allowed.

Access would be afforded through the means identified above, thus restricting unguided

access to ceremonial and other cultural sites of the South Unit. Pristine areas would be set aside for limited access through guided tours only. Visitor participation at scientific activity sites, such as paleontological digs, would be controlled.

Cumulative Effects. Traffic projections indicate that a substantial increase in park visitation could result from the completion of the Heartland Expressway and the proposed Crazy Horse Scenic Byway. The increase from these roads originating from the south and west, added to visitation projections, could alter the current visitation patterns to the park. The routes for these two road projects already exist, but typically park visitors do not use them. Visitors' access to the park's South Unit would be improved by the upgrading of the roads and by their being emphasized with designations.

Conclusion. By improving access in the South Unit, alternative D would produce a beneficial effect on visitor access. The improvement in access would come from the construction of two new entrance stations, improvement of the local roads, guided tours into the backcountry, construction of new parking lots, increased camping opportunities, the development of interior pedestrian trails, and improved signage on surrounding roads. Access into the backcountry would be limited, and an emphasis would be placed on educational opportunities in the backcountry and on Lakota history and culture.

Availability of Information

Analysis. Under alternative D, park managers would continue to share the responsibility for managing the White River Visitor Center. The visitor center would be staffed by tribal personnel. Park managers would design the exhibits with OST input. However, under alternative D, interpretive opportunities would be offered to visitors in a variety of new ways:

- Emphasis would be placed on the preservation of Lakota language and culture through a variety of education and interpretation programs, such as family history and living history, monuments that memorialize events in

Lakota history, and wayside exhibits that focus on native background and history. Exhibits at the visitor contact centers and the LHEC would include information about Oglala history and culture. A living history village would be created. Visitors would be able to explore the history and culture of the area, the resources, and traditional land management through tours led by Tribal members. Additionally, there would be opportunities for visitors to see and purchase Oglala art and crafts. Audio tours would be available. Bilingual (English and Lakota) signs would be used on roads, in interpretive displays, and elsewhere.

- Historic and cultural discovery would occur at activities such as powwows and ceremonies. At some cultural or ceremonial sites, as well as at campgrounds, interpretive activities would be presented so visitors could learn more about the Lakota culture and history. Programs would feature tribal members who wear and explain traditional dress, and story-telling and oral history would be presented by tribal elders.
- Interpretation of the Bombing Range would continue.
- Paleontology digs, monitored by trained park personnel, might be observed by visitors, and outdoor classrooms might be offered by the staff.
- Interpretive signs would be placed along roads to identify locations, animals and plants, historic locations, and mileages.
- The exhibits at the White River Visitor Center would be improved and expanded, and a visitor contact station would be developed on the west side of the South Unit. Interpretation and orientation information would also be available at the LHEC.

As a result of the expanded interpretive opportunities under alternative D, including the new visitor contact station on the west side of

the South Unit, beneficial impacts on the availability of information about park resources would occur.

Cumulative Effects. The development of the proposed interpretive trails under the Nebraska National Forest Land and Resource Management Plan could also provide additional opportunities to disseminate information to visitors. These projects would produce beneficial effects on the availability of information for visitors.

Conclusion. Alternative D would result in beneficial effects on the availability of information about the park. The increase in the number of outlets where visitors could obtain information and the dispersed locations of these outlets would substantially improve the visitor experience.

Range and Enjoyment of Visitor Activity

Analysis. Vehicle use, hiking and pack stock use, camping, and picnicking are the four most popular activities.

Vehicle Use. Along the perimeter of the park there would be arts and crafts outlets, powwow grounds, and modern equestrian grounds, and visitor amenities accessible by vehicle. Developed perimeter access would be focused in one location with trails, trailheads, parking areas, rest areas with comfort stations, overlooks, and wayside exhibits. Visitors could explore the South Unit at dispersed visitor access points along the perimeter. There would be an improved road to the quarry area, which would feature parking, restrooms, trailheads, and campsites. Two-track unimproved roads in the interior would be used for administrative access only. The interior would not have visitor facilities, and there would not be any improved or maintained roads for visitor use other than the road to the quarry. Therefore, beneficial impacts would occur from providing improved access on the perimeter of the park, while eliminating vehicles from much of the rest of the South Unit.

Hiking and Pack Stock Use. Recreational opportunities would be available through guided hikes, and unpaved hiking trails and camping sites would be established along the perimeter of

the South Unit. Hiking would be allowed on some primitive trails in the Natural Area / Recreation Zone, with limited access to the Palmer Creek Unit. Park management would institute a permit trail system for unguided access into the interior; guided access would be allowed. Guided trail tours would take visitors to select areas in the interior. Thus, beneficial impacts to hiking and pack stock use would occur as a result of developing a small amount of additional hiking trails and pack stock opportunities under alternative D.

Camping. Some developed camping sites would be established and available around the perimeter of the South Unit. Backcountry camping would be allowed in designated interior areas by permit. Therefore, beneficial impacts to camping would occur from established camping on the perimeter of the South Unit, while also eliminating camping from much of the rest of the South Unit.

Picnicking. There would be expanded opportunities to picnic, such as along the perimeter of the South Unit, but picnicking would be limited to much of the rest of the South Unit.

Cumulative Effects. It is projected that various plans for road improvements in the region would increase opportunities for driving and sightseeing. If the proposed Crazy Horse Scenic Byway were designated and marked by signs, it would offer an additional scenic driving opportunity in the region. The management plan for Buffalo Gap National Grassland calls for the development of a primitive campground near the South Unit, expanding the region's camping opportunities (USFS 2001). These projects would result in beneficial impacts for visitors seeking recreational opportunities in the region.

Conclusion. There would be slightly more opportunities throughout the park for visitors seeking to drive/sightsee, hike, camp, and/or picnic, creating beneficial effects on such visitors.

SOCIOECONOMICS

Analysis. Implementation of alternative D would be expected to lead to an increase in

expenditures on staff and operations over the No-Action Alternative. The total number of staff needed under this alternative would be expected to increase to 26 FTEs at a cost of \$3.1 million per year. In addition, implementation of this alternative would be expected to generate additional expenditures for the construction or rehabilitation of facilities (\$21.8 million) and development of a number of studies and plans (\$4.7 million), all of which are considered one-time costs. On-going operations would bring well paying, permanent employment opportunities to a traditional, economically depressed area and could have noticeable economic benefits. In addition, one-time construction and plan and study costs could also generate minor to moderate economic impacts throughout the larger study region, though these impacts are expected to be short-term. This infusion of federal agency spending into the economy is likely to generate additional economic activity in terms of jobs and income. The intensity of these impacts would depend on the ability of local firms to have the necessary skills and expertise to meet the requirements of the construction and study projects.

Visitation under alternative D would be expected to increase over the long-term with the expansion of access and opportunities at the South Unit. Increases in visitation could lead to increase visitor spending in the local and regional economies as more visitors spend money while visiting the area or extend their stays in Southwest South Dakota. Sustained increases in visitation to the South Unit may also generate additional economic development outside park boundaries which would generate additional economic benefits to a traditionally economically depressed region.

Implementation of alternative D could also cause negative economic impacts as grazing leases are eliminated over time at the South Unit.

Cumulative Impacts. Past, present, and anticipated projects that would contribute to impacts on socioeconomics include (1) the cleanup of the former Bombing Range; (2) resource management under the North Unit GMP/EIS; and (3) approval of the proposed

Crazy Horse Scenic Byway. These combined actions would likely have short- and long-term beneficial impacts on socioeconomics due to increased access and exposure to the opportunities at the South Unit. The cumulative effects of all these projects could lead to additional visitation to the South, potentially generating additional economic benefits through increased visitor spending. The impacts of other past, present, and anticipated projects, when considered with the impacts of Alternative D, would result in short- and long-term minor impacts on socioeconomics.

Conclusion. The socioeconomic effect of operations and visitor use at the South Unit under the alternative D would be expected to have beneficial economic impacts.

PARK OPERATIONS

Analysis. Staffing levels would increase to approximately 26 full-time positions to implement the actions of alternative D. Under this alternative it is estimated that the park would need an annual operating budget increase of approximately \$3.1 million to operate the South Unit once the alternative is fully implemented. In the South Unit this would result in expanding a wide range of recreation opportunities, improving interpretation and education, improving resource protection, law enforcement, and administration. This would also lead to better services and programs, such as developing an education and outreach program. Expanded staff levels would be ready to face future changes. Knowing the value of promoting volunteers in the park in view of continual shrinking budgets, major emphasis would also be placed on interagency volunteer coordination, which would efficiently leverage partnerships and volunteers to achieve the purposes of the park. Programs to involve volunteers in inventory, monitoring, interpretation and outreach, cultural resource data collection, resource restoration, area or campground hosting, trail patrol, light maintenance, and other aspects of park operations would be continued and expanded. The effects on the park and particularly the

South Unit would be major, beneficial, and long term.

Cumulative Impacts. There would continue to be a strong demand for the recreational opportunities the South Unit would offer as well as those associated with nonprofit organizations and volunteers to be partners in managing all federal lands, not just those of the NPS. The region and the country at large has a strong and growing population of highly skilled, senior population with outside sources of income, who tend to volunteer and would likely be able to supply adequate volunteer services. Even with increasing demands, better organization and use of volunteers would keep supply abreast with demand and benefit park operations.

Conclusion. A clear plan of action and increased staff to implement those actions would result in highly effective park operations and coordination of partners and volunteers to protect resources and serene visitors. The effect would be beneficial.

UNAVOIDABLE ADVERSE IMPACTS

Under alternative D (preferred alternative) the activities related to the construction of additional facilities as well as human use, would result in minor adverse impacts on natural resources in some areas of the South Unit. Although these impacts (e.g., soil compaction, vegetation trampling, wildlife disturbances, and decreased opportunities for solitude) would be unavoidable, mitigation to reduce them would be carried out where possible. The impacts on wildlife, vegetation, and the visitor experience, are discussed in detail for the specific impact topics.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Under alternative D, there would be a commitment of land, raw materials and consumption of fuels associated with the construction of perimeter facilities as described in detail in “Chapter 3: Alternatives, Including the Preferred Alternative.” These commitments

represent an irretrievable commitment of resources for a period of time.

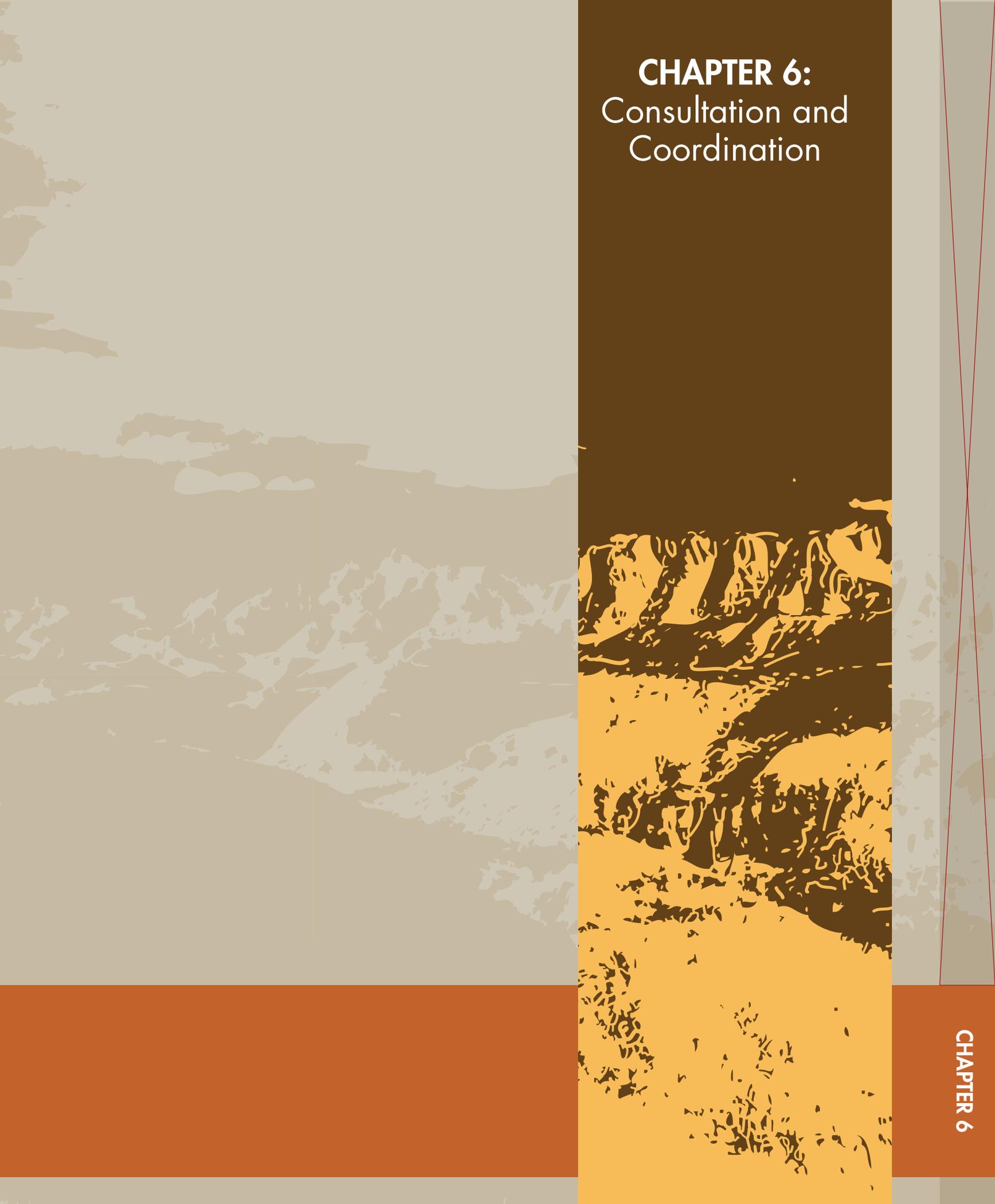
RELATIONSHIP OF SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

The South Unit would be managed with a Natural Area/Recreation Zone (approximately 90 percent), a Research Zone (less than 1 percent) and a Development Zone (approximately 10 percent), allowing the South Unit to maintain its long-term productivity.

Under alternative D there would be highly developed visitor use and administrative facilities constructed in the Development Zone as well as more primitive facilities for the same purpose within the Natural Area/Recreation Zone. There would be some localized loss of

ecological productivity as a result. The proposed developments within both zones could reduce ecological productivity in some localized areas as a result of construction and increased use. Actions would be taken to minimize adverse effects on the long-term productivity of biotic communities. Proposed actions would yield long-term benefits from a visitor experience perspective.

Short-term impacts such as impacts to soils might result from construction, as detailed in the analyses of specific impact topics. Noise and human activity from construction and restoration might displace some wildlife from the immediate area. However, these activities would not jeopardize the long-term productivity of the environment except in areas permanently occupied by new facilities.



CHAPTER 6: Consultation and Coordination

PUBLIC AND AGENCY INVOLVEMENT

The *South Unit General Management Plan / Environmental Impact Statement* (South Unit GMP/EIS) represents thoughts presented by the National Park Service (NPS), other agencies, American Indian tribes, and the public.

Consultation and coordination among the tribes, agencies, and the public were vitally important throughout the planning process. During initial scoping, the public had two primary avenues by which it participated during the development of the plan: participation in public scoping meetings and responses to newsletters. In each of these formats, the public was invited to comment on the concepts for management provided in newsletters and to share with the team any issues or concerns to be considered in the South Unit GMP/EIS.

CONSULTATION AND NEGOTIATION BETWEEN OGLALA SIOUX TRIBE AND NATIONAL PARK SERVICE

In 2000, the NPS held public scoping meetings at the initial stage of work on a new general management plan. By 2002 disagreements arose between the NPS and OST regarding the conduct of paleontological activities in the South Unit, ultimately leading to a moratorium on such activities, ratified by the Oglala Sioux Tribal Council on September 4, 2002 with Resolution 02-91. The NPS, OST, and Bureau of Indian Affairs (BIA) entered into formal negotiations concerning the future management of the South Unit. At that time, the decision was made to continue the planning process for the North Unit only, and to postpone the South Unit GMP/EIS until 2006.

Early in 2006, following the arrival of a new park superintendent, the South Unit GMP/EIS effort resumed. The GMP team included Midwest Region and Badlands National Park staff, Oglala Sioux Parks and Recreation Authority (OSPRA) staff, and members of the OST.

Once the work resumed on the South Unit GMP/EIS, nine workshops were held by the

OST and NPS planning team. Three formal meetings were held in Omaha between OST representatives (including Tribal president) and NPS Midwest Regional Office reps (including Regional Director). Four formal briefings were held in Washington, D.C., with leadership from the NPS and the Department of the Interior. One briefing was held with the Coalition of NPS Retirees.

Concurrent with the development of the South Unit GMP/EIS, the OST Land Committee passed a resolution supporting the South Unit GMP process. The resolution was passed by the full Oglala Sioux Tribal Council on June 29, 2010. The resolution further supports the preferred alternative, a public comment period and appoints OSPRA and the Land Committee to continue government-to-government consultation throughout the GMP process and keep the Oglala Sioux Tribal Council apprised of developments.

SCOPING MEETINGS AND NEWSLETTERS

General management planning for Badlands National Park is guided by the major elements of park planning and decision making prescribed by the *National Environmental Policy Act* and other federal laws, as well as by NPS policies. The NPS consulted with American Indian Tribes and held scoping meetings in surrounding communities in 2000 to identify the public's concerns about issues facing the park. The planning team, composed of NPS staff and OST members, then developed statements regarding the park's purposes and significance based in part on those scoping comments.

A Notice of Intent to prepare an Environmental Impact Statement was published in the *Federal Register* on April 24, 2007. The South Unit GMP/EIS planning team developed a set of management options describing how the management and operations of the South Unit could be accomplished with varying degrees of involvement by the NPS and OST, and a set of alternatives that propose ways that the South

Unit resources and visitor experience could be managed.

The preliminary management options were presented to the public during open houses in the spring of 2008. Approximately 10,000 scoping newsletters (Newsletter #1) were printed in English and Lakota and distributed to announce the beginning of the South Unit GMP process. In addition, a press release was distributed to approximately 30 media outlets.

A month after the newsletter was released, 17 public open houses were held in Wall, Rapid City, Denver, and on the Pine Ridge Reservation. A total of 254 people attended those meetings, as shown in table 16. A total of 255 comments were recorded at the open houses and submitted by mail, email, and on the park and NPS websites. The comments from all sources were compiled and reviewed by the GMP planning team as it refined the preliminary management options, and developed the resource and visitor experience alternatives.

The comments reflected a public that is passionate about the future of the South Unit's resources, uses, and management. Many of the commenters provided detailed recommendations on how areas in the park should be managed, which resources are most important to protect or preserve, and what they would like to see for the future of the South Unit.

TABLE 16. PUBLIC OPEN HOUSES FOR SOUTH UNIT GENERAL MANAGEMENT PLAN / ENVIRONMENTAL IMPACT STATEMENT, SPRING 2008

2008 Date	Location	Number of Attendees
April 7	Red Shirt	29
April 8	Oglala	16
April 9	Manderson	11
April 9	Rapid City	27
April 11	Batesland	6
April 11	Wakpamni	12
April 14	Pine Ridge	25
April 14	Pass Creek (Allen)	16
April 15	La Creek (Martin)	8
April 15	Wanblee	36
April 16	Kyle	20
April 17	Wounded Knee	24
April 18	Porcupine	11
May 28	Denver	3
TOTAL		254

The topics addressed by the public in these 2008 comments were organized into major topics that broadly describe the nature of the comments (Summary of Comments Received (PEPC website):

- **What the public values about the park.** The responses varied: there were those who appreciate the beauty and serenity, the South Unit's natural resources, and the fossils; others appreciate and value the historic landscapes.
- **Thoughts/suggestions about the proposed management concepts.** Of approximately 255 comments directly addressing the management concepts, the vast majority preferred a change from current management. There was no clear preference between shared management of the South Unit of Badlands National Park, creation of a new national park unit managed by the OST with technical assistance from the NPS, and deauthorization of the South Unit with no connection to the NPS. In addition, about 20 commenters suggested a gradual progression from shared management of the South Unit to eventual deauthorization.
- **Issue-specific statements regarding the current or future management of the park that should be addressed by the plan.** Access to the South Unit was raised as an issue by many commenters who expressed very passionate views and opinions. The comments ranged from broadly supporting or opposing more access to identification of specific concerns regarding access. Some commenters expressed a desire that the park be accessible and that access not be limited, while others are concerned about an increase in development and the possible ramifications of increased access to the park.
- **Cultural Resources.** Commenters want the cultural and historical sites protected, but want Oglala history and culture shared through interpretive

programs, oral histories, and "hands-on" experiences. Spiritual and cultural preservation was a common theme.

- **Education/interpretation/training.** Comments related to education and interpretation focused on methods for visitors to learn more about the history and culture of the Oglala people, and on training opportunities for Tribal members.
- **Facilities/infrastructure.** Comments received regarding concerns about development in the park included development of facilities either in a broad sense or in particular areas, and commercial development. Some commenters were concerned about overdevelopment of the park in the future.

There was much support for development of a visitor center or other facility to feature Oglala history, culture, crafts, and a place where artwork could be sold. There was also support for a museum for fossils and cultural artifacts. Some commenters wanted to see a hotel and other tourism infrastructure, such as an amphitheater, rodeo and pow wow grounds, and a café. Others suggested improved roads, scenic drives with overlooks, backcountry and developed campgrounds, and trails/trailheads for hiking and horseback riding. Several commenters proposed minimum development, restricted to the perimeter of the South Unit.

- **Natural Resources.** During the scoping process, comments were received regarding concerns or issues about preservation of resources. Natural resource-related concerns included protection of fossils and plants that are used for medicinal and spiritual purposes, reintroduction of native prairie grasses, and replacing cattle with buffalo (bison). Several commenters would like to have the resource managed under traditional Oglala ecosystem methods. Numerous

comments centered on renewable energy sources – wind, geothermal, solar -- and carbon credits. Other issues of concern were mining, particularly of zeolite, use of pesticides and herbicides, protection of watersheds, and pollution generated from car exhaust.

- **Management/operations.** Many commenters were concerned about management of the South Unit, the lack of facilities, and enforcement of regulations. A number of commenters raised concerns about law enforcement and the need for more rangers in the park. Several comments focused on a desire to see the Tribe exercise its sovereignty through managing the South Unit. There was overwhelming support for Tribal management, with a variety of suggestions for which Tribal entity (OST, OSPRA, Land Committee, or other entity) would have the management responsibility.

A follow-up newsletter (Newsletter #2) detailed the results of the public scoping, and presented a schedule for the remainder of the planning process.

CONSULTATION WITH STATE AND TRIBAL HISTORIC PRESERVATION OFFICERS

On June 11, 2007 a letter was sent to the State Historic Preservation Officer.

According to Section 106 of the *National Historic Preservation Act* of 1966, as amended (16 USC 470, et seq.), agencies that have direct or indirect jurisdiction over historic properties are required to take into account the effect of any undertaking on properties eligible for the National Register of Historic Places. To meet the requirements of 36 CFR 800, the National Park Service sent letters to the South Dakota Historic Preservation Office and the Advisory Council on Historic Preservation, inviting their participation in the planning process. Both offices were sent a copy of the newsletter, with a request for their comments.

On November 14, 2008, the NPS, Advisory Council, and the National Conference of State Historic Preservation Officers signed a new Programmatic Agreement, replacing the 1995 Programmatic Agreement. The 2008 Programmatic Agreement will govern future Section 106 activities.

On February 23, 2005, the Executive Committee of the OST created the position of a Tribal historic preservation officer by passing Resolution 05-23XB. In doing so, the Executive Committee also established an Oglala Lakota Historic Advisory Council. As of October 1, 2009, the Tribal Historic Preservation Officer officially assumed what were the State Historic Preservation Officer responsibilities under Section 101(d) of *National Historic Preservation Act*. This means that the Tribal Historic Preservation Officer now has Section 106 responsibilities at the South Unit and on all tribal lands within the Pine Ridge Indian Reservation. The NPS will consult with the Tribal Historic Preservation Officer, who will be given a copy of the draft GMP/EIS and asked to provide a determination on adverse impacts from the proposed action. NPS will consult with the Tribal Historic Preservation Officer. The Tribal Historic Preservation Officer will be given a copy of the draft GMP/EIS for review and the NPS will request their determination on adverse impacts from the proposed action.

CONSULTATION WITH OTHER TRIBES

On June 11, 2007, the National Park Service sent letters to the following Native American groups inviting them to participate in the planning process:

- Cheyenne River Sioux Tribe
- Crow Creek Sioux Tribe
- Flandreau Santee Sioux Tribe
- Lower Brule Sioux Tribe
- Oglala Sioux Tribe
- Rosebud Sioux Tribe
- Sisseton-Wahpeton Sioux
- Standing Rock Nation
- Yankton Sioux Tribe

Responses were received from Rosebud Sioux Tribe and Flandreau Sioux Tribe as follows:

Rosebud Sioux Tribe

The Tribe responded on June 26, 2007, that they do have concerns and interests in this area and want to be informed of all projects.

Flandreau Santee Sioux Tribe

The Tribe responded on June 12, 2007, that they have no objections. However, if human skeletal remains and/or any objects falling under the *Native American Graves Protection and Repatriation Act* of 1990 are uncovered during construction, please stop immediately and notify their appropriate persons (state and tribal *Native American Graves Protection and Repatriation Act* representative).

In addition, the NPS presented the preliminary alternatives to the Oglala Sioux Tribal Council. The presentation included an overview of the alternatives, a description of the next steps that would be taken in the planning process, a summary of the public comments, and an opportunity for questions and discussion. The Tribe was particularly interested in efforts to increase visitation to the South Unit, opportunities for economic development on the reservation near the South Unit, and protection of sacred sites in the park. Members of the planning team also have met with various committees and tribal offices to brief them on the planning effort. In addition, the tribes will have an opportunity to review and comment on this draft plan.

CONSULTATION WITH THE U.S. FISH AND WILDLIFE SERVICE

The Endangered Species Act of 1973, as amended, requires in Section 7 (a) (2) that each federal agency, in consultation with the Secretary of the Interior, ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical

habitat. This section of the Act sets out the consultation process, which is further implemented by regulation (50 CFR 402).

The NPS initiated formal consultation with the U.S. Fish and Wildlife Service (USFWS) in November 2008 to determine the presence of federally listed threatened and endangered species in the South Unit. To remain up to date on listed and proposed threatened and endangered species, the NPS consulted the USFWS website. Copies of the two newsletters also were provided to the USFWS and the agency will be given a copy of this draft document for review.

OTHER AGENCIES AND ORGANIZATIONS TO WHICH THIS DOCUMENT WAS SENT

The following agencies, officials, local governments, organizations, businesses and news organizations received information about the South Unit GMP/EIS through receipt of the newsletters.

Federal Agencies

Advisory Council on Historic Preservation
U.S. Department of Agriculture
 U. S. Forest Service
 Natural Resource Conservation Service
U.S. Department of the Interior
 Bureau of Indian Affairs
 U.S. Geological Survey [no copies of letters in PEPC]
U.S. Environmental Protection Agency

State-elected Federal Officials

Senator Tim Johnson
Senator John Thune
Representative Stephanie Herseth Sandlin

Elected State Officials

M. Michael Rounds, Governor of South Dakota

State of South Dakota Agencies

Department of Agriculture

Department of Environment and Natural Resources
Department of Game, Fish and Parks
Department of Transportation
State Historic Preservation Office

Local Governments

Jackson County
Pennington County
Shannon County
Mayor of Wall
Mayor of Interior

Organizations and Businesses

Handicapped Travel Club (Nevada)
Keystone Area Historical Society (South Dakota)
Prairie Homestead Museum (South Dakota)
Badlands Petrified Gardens (South Dakota)
Corn Palace (South Dakota)
South Dakota Stockgrowers Association
Wall Drug (South Dakota)
Lakota Student Alliance (South Dakota)
Ducks Unlimited (North Dakota)
Great Plains Restoration Council (Texas)
The Conservation Fund (Oregon)
Black Hills, Badlands and Lakes Association (South Dakota)
Sierra Club (South Dakota)
American Museum National History (New York)
NPCA (Illinois)
Science and Tech Services (Colorado)
Forever Resorts (Arizona – Cedar Pass Concession Operator)
Wyoming Dinosaur Center
Faunal Analysis and CRM Services (Idaho)
South Dakota Chapter of Wildlife Society
Wall Chamber of Commerce (South Dakota)
National Wildlife Federation (Montana)
Lakota Fund (South Dakota)
Society of Vertebrate Paleontology (Illinois)
Florida Museum of Natural History
American Motorcyclist Association (Ohio)
Orton Geological Museum (Ohio)
Isaac Walton League (South Dakota)
Friend of the Earth (Washington, DC)
Wounded Knee Visitor Center (South Dakota)
Mammoth Site (South Dakota)

NEWS MEDIA

Bennett County Booster
Central Dakota Times
Custer County Chronicle
Denver Post
Kadoka Press
KBHE News
KELOLAND TV
KEVN News
KILI Radio
KOTA News
Midwest Living
Minneapolis Star-Tribune
Mitchell Republic
Murdo Coyote
Missouri Valley Sun
Sioux Falls Argus Leader
Pierre Capitol Journal
Rapid City Journal
Pioneer Review
KQSK Radio
South Dakota Public Broadcasting
Black Hills Press

Responses were received from the U.S. Environmental Protection Agency (EPA) (May 25, 2007) and Society of Vertebrate Paleontology (June 15, 2009), summarized as follows.

U.S. Environmental Protection Agency (EPA)

The EPA provided comments in anticipation of review of the Draft EIS recommending that it include environmental considerations for air quality, soil erosion and vegetation; water resources, and connection actions such as any actions occurring outside of the South Unit that would influence the management of or impact the resources of the South Unit (expansion, mining, human actions). The EPA will be given a copy of this draft document for review.

Society of Vertebrate Paleontology

The Society of Vertebrate Paleontology responded that the South Unit contains extremely important vertebrate fossils and has contributed to much of our understanding of life in North America 37 million years ago. As valuable as these discoveries have been, much

work remains to be done; and the South Unit has much more to tell about this story. The Society of Vertebrate Paleontology feels it is critical for the South Unit GMP to provide for the proper management of its paleontological resources. This management should include a system that enables qualified researchers to obtain permits and allows them to properly collect these resources. These permit applications, research plan, and results should be reviewed by a qualified paleontologist in order to ensure that the research is properly carried out. These resources should be curated in public institutions that guarantee access for future researchers and should remain property of the people of the United States.

PUBLIC REVIEW OF THE DRAFT SOUTH UNIT GMP/EIS

After this draft South Unit GMP/EIS is distributed, there will be more public meetings to give the public an opportunity to discuss the alternatives and provide comments and suggestions. Although the alternative preferred by the NPS is identified in this document, the agency will not make a final decision about which alternative to implement until the public has had the opportunity to review and comment on the draft plan. The NPS will evaluate all comments in consultation with Tribal representatives. The formal comment period begins with the distribution of this draft document. Interested parties have 60 days to review this draft plan and send their comments

to the NPS. Comments should be sent to the following address:

National Park Service
c/o Sharon Miles, DSC-P
12795 W. Alameda Parkway
Denver, CO 80228

The public may also comment online at <http://parkplanning.nps.gov/parkHome.cfm?parkId=117>, or <http://www.nps.gov/badl>. Comments sent by e-mail also will be accepted. The e-mail address is badl_planning@nps.gov.

During the review period, the National Park Service will conduct a series of public meetings to answer questions and receive comments. Each comment will be carefully considered, and responses to substantive comments will be included in the final GMP/EIS. Depending on the comments received during public and agency review, some elements of the alternatives may change in the final plan.

After at least a 30-day no-action period, a Record of Decision approving the final plan will be signed by the NPS Regional Director. With the publication of the signed Record of Decision in the *Federal Register*, the plan can then be implemented, dependent upon legislation and funding. Implementation would not be possible without legislation and funding. Until then, the status quo would remain in effect. In the interim, the park and tribe agree to prepare for and implement the parts of this plan that are possible and appropriate.

